Classified

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: NEO-RAY

Report Number: P78427

Luminaire Tested: **DFN2DIP-RG3F0-060D050US935-FLL-FLL-1DUDD-W**

Issue Date: 02/20/2024

Report Generated By 670245763 / DESKTOP-DVLU35A

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:	P78427
	TEST IS SCALED FROM IESNA LM-79-08 TEST DATA
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	02/20/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	NEO-RAY
Catalog Number:	DFN2DIP-RG3F0-060D050US935-FLL-FLL-1DUDD-W
Description:	Define Geo Ring 3ft Diameter Direct/Indirect Fixture w/ Frosted Lens
Light Source:	3500K CCT, 90 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	10606.6 lumens
Efficiency:	N/A
Efficacy:	81.3 lumens/watt
Spacing Criteria (0/90/45):	1.11 / 1.11 / 1.21
Luminous Opening:	Circular (Dia: 3' x H: 0')
CIE Type:	General Diffuse

Input Watts (W):	130.5
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:	25 FT

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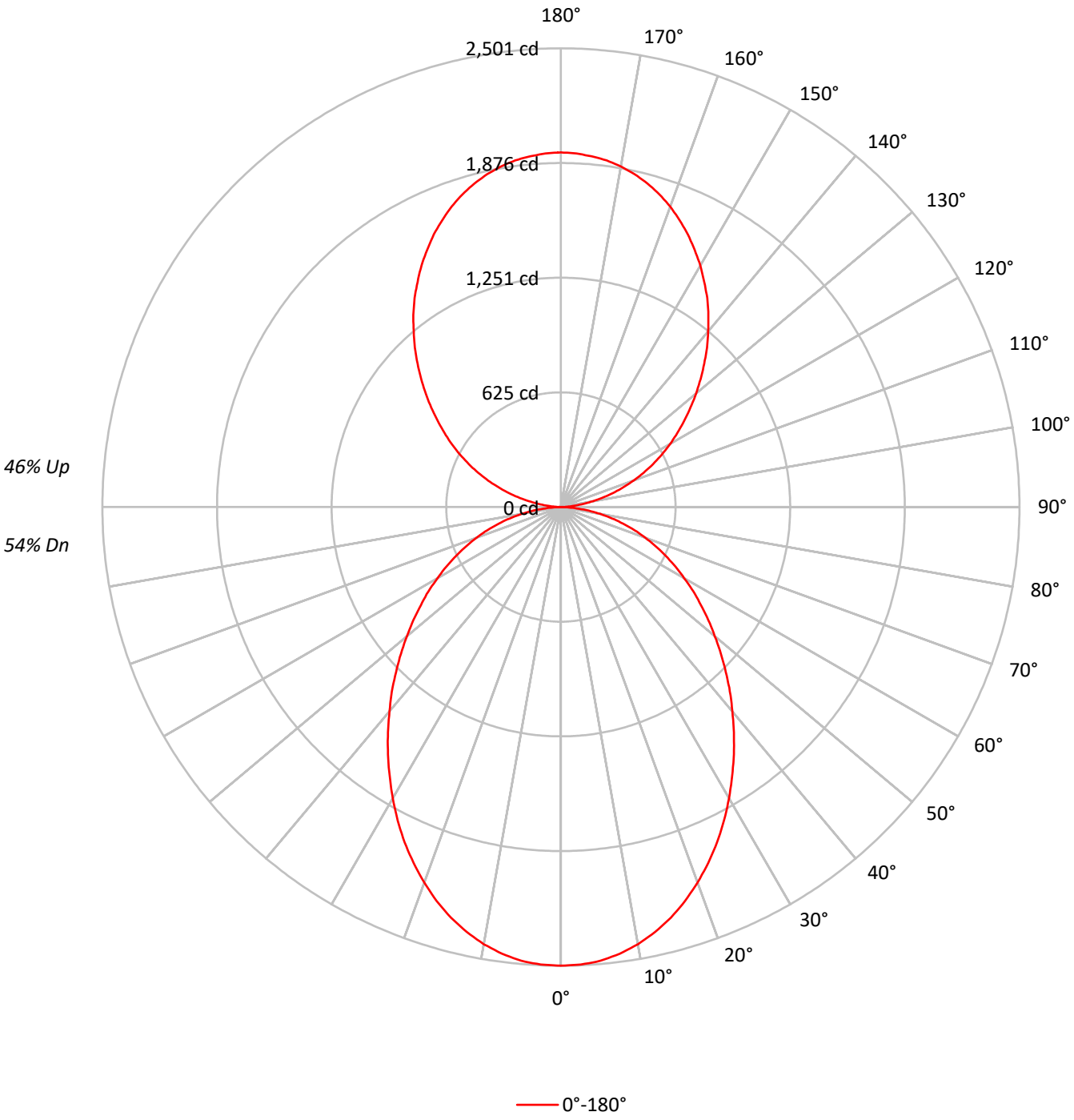
CATALOG NUMBER: DFN2DIP-RG3F0-060D050US935-FLL-FLL-1DUDD-W

Luminous Intensity Polar Plot



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TEST NUMBER: P78427
CATALOG NUMBER: DFN2DIP-RG3F0-060D050US935-FLL-FLL-1DUDD-W

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	108	108	108	108	100	100	100	100	86	86	86	72	72	72	60	60	60	54
1	99	95	91	87	92	88	84	81	75	73	71	64	62	60	53	52	51	46
2	90	83	77	71	83	77	72	67	66	62	59	56	53	51	47	45	43	39
3	82	73	66	60	76	68	61	56	59	54	50	50	46	43	42	39	37	33
4	75	65	57	51	70	60	53	48	52	47	42	45	40	37	38	34	32	28
5	69	58	50	44	64	54	47	41	47	41	37	40	36	32	34	31	28	25
6	64	52	44	38	59	49	41	36	42	37	32	36	32	28	31	27	25	22
7	59	47	39	33	55	44	37	32	38	33	29	33	29	25	28	25	22	20
8	55	43	35	30	51	40	33	28	35	29	25	30	26	23	26	23	20	18
9	51	39	32	27	48	37	30	25	32	27	23	28	24	20	24	21	18	16
10	48	36	29	24	45	34	27	23	30	24	21	26	22	19	22	19	16	15

AVERAGE LUMINANCE (cd/sqm):

	0°
0°	3808
5°	3796
10°	3743
15°	3654
20°	3530
25°	3388
30°	3224
35°	3058
40°	2891
45°	2738
50°	2596
55°	2474
60°	2368
65°	2273
70°	2181
75°	2063
80°	1922
85°	1499

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	235.0	2.2
10°-20°	651.5	6.1
20°-30°	926.8	8.7
30°-40°	1028.2	9.7
40°-50°	982.6	9.3
50°-60°	836.2	7.9
60°-70°	626.1	5.9
70°-80°	372.5	3.5
80°-90°	103.6	1.0
90°-100°	78.2	0.7
100°-110°	309.2	2.9
110°-120°	548.5	5.2
120°-130°	735.5	6.9
130°-140°	853.3	8.0
140°-150°	868.6	8.2
150°-160°	754.2	7.1
160°-170°	514.3	4.8
170°-180°	182.2	1.7
0°-30°	1813.3	17.1
0°-40°	2841.5	26.8
0°-60°	4660.3	43.9
0°-90°	5762.5	54.3
90°-120°	936.0	8.8
90°-150°	3393.4	32.0
90°-180°	4844.0	45.7
0°-180°	10606.6	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	2501	
5°	2484	235
15°	2318	652
25°	2016	927
35°	1645	1028
45°	1271	983
55°	932	836
65°	631	626
75°	351	372
85°	86	99
90°	1	9
95°	64	74
105°	293	309
115°	554	549
125°	821	736
135°	1105	853
145°	1391	869
155°	1640	754
165°	1826	514
175°	1920	182
180°	1934	

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CANDELA DISTRIBUTION (FULL):

	0°
0°	2500.6
2.5°	2496.8
5°	2483.5
7.5°	2456.8
10°	2420.6
12.5°	2372.9
15°	2317.6
17.5°	2252.8
20°	2178.5
22.5°	2100.4
25°	2016.5
27.5°	1926.9
30°	1833.5
32.5°	1738.2
35°	1644.8
37.5°	1549.5
40°	1454.2
42.5°	1364.7
45°	1271.3
47.5°	1183.6
50°	1095.9
52.5°	1014.0
55°	932.0
57.5°	857.7
60°	777.6
62.5°	705.2
65°	630.9
67.5°	560.4
70°	489.8
72.5°	421.2
75°	350.7
77.5°	285.9
80°	219.2
82.5°	152.5
85°	85.8
87.5°	32.4
90°	1.4
92.5°	27.0
95°	63.9
97.5°	112.2
100°	167.7
102.5°	228.8
105°	292.7
107.5°	356.6
110°	422.0

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CATALOG NUMBER: DFN2DIP-RG3F0-060D050US935-FLL-FLL-1DUDD-W

CANDELA DISTRIBUTION (continued):

	0°
112.5°	*487.3*
115°	*554.1*
117.5°	*620.9*
120°	*687.7*
122.5°	*753.0*
125°	*821.2*
127.5°	*890.9*
130°	*961.9*
132.5°	*1032.9*
135°	*1105.4*
137.5°	*1179.3*
140°	*1248.9*
142.5°	*1321.4*
145°	*1391.0*
147.5°	*1454.9*
150°	*1520.3*
152.5°	*1580.0*
155°	*1639.6*
157.5°	*1692.2*
160°	*1743.3*
162.5°	*1787.4*
165°	*1825.8*
167.5°	*1858.4*
170°	*1885.4*
172.5°	*1906.7*
175°	*1919.5*
177.5°	*1929.5*
180°	*1933.7*

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

NEO-RAY

Report Number: SP1-2401-290-3

Test Date: 01/18/2024

Luminaire Tested: RNG2DIP-RG2F0-020D020US935-FLL-FLL-1-D-UDD-W

Data in this report applies to families of products including RNG2DIP-RG2F0-020D020US935-FLL-FLL-1-D-UDD-W.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v6.13

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

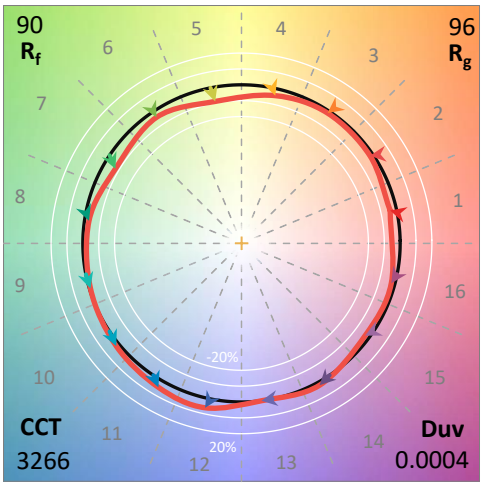
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2401-290-3
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	01/19/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	NEO-RAY
Catalog Number:	**RNG2DIP-RG2F0-020D020US935-FLL-FLL-1-D-UDD-W**
Description:	2' RING DIRECT/INDIRECT FIXTURE WITH FROSTED LIGHT LEVEL 1

Spectral Parameters

CCT (K):	3266	CRI (Ra):	94.3		
CIE u':	0.2418	R1:	95.8	R9:	70.9
CIE v':	0.5165	R2:	99.6	R10:	97.8
Duv:	0.0004	R3:	97.8	R11:	93.7
CIE x:	0.4195	R4:	92.3	R12:	78.5
CIE y:	0.3983	R5:	94.5	R13:	97.3
CIE z:	0.1822	R6:	96.9	R14:	99.5
Peak Wavelength (nm):	622	R7:	91.7		
Dominant Wavelength (nm):	581	R8:	85.8		
Purity:	45.7				

Rf:	89.7
Rg:	96



Test Conditions

Stabilization Time:	23M
Operation Time:	12H
Room Temperature (°C) / RH%:	25.6/15%
Sphere Temperature (°C):	25.0

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REPORT NUMBER: SP1-2401-290-3

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	8/9/2023	2/9/2024
Power Meter	XITRON 2801 IN0071	10/23/2023	10/23/2024
AC Power Source	CHROMA 61603 IN0063	10/24/2023	10/24/2024
DC Power Source	AGILENT E3634A IN0208	10/24/2023	10/24/2024
Sphere Thermometer	ONSET IN0085	10/24/2023	10/24/2024
Room Thermometer	ONSET IN0046	10/24/2023	10/24/2024

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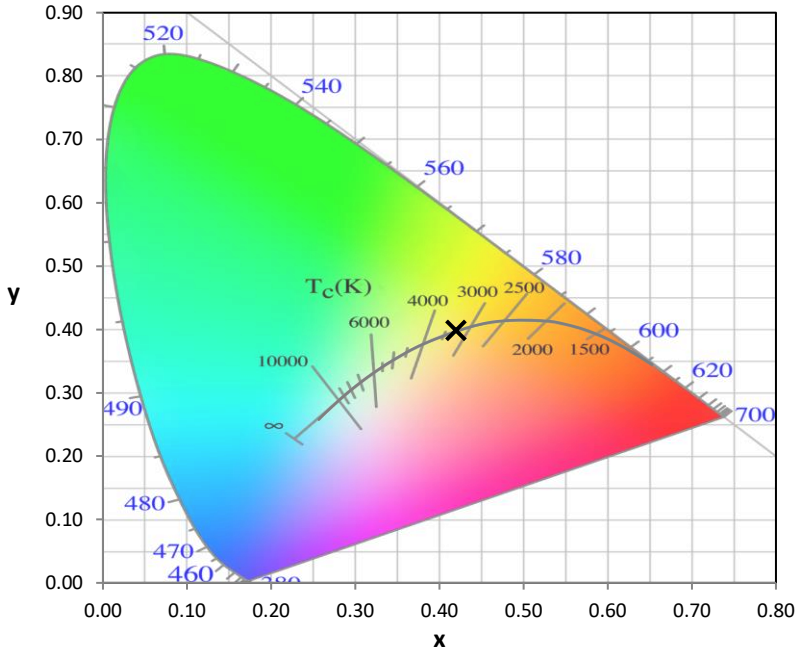
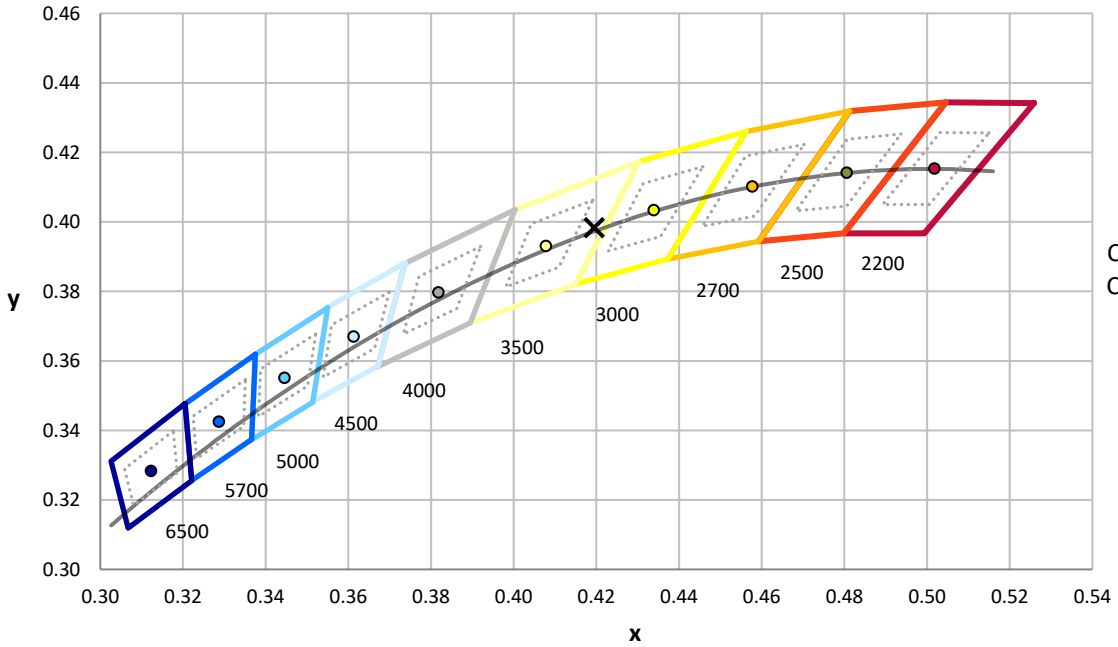
CIE 1931 Chromaticity Diagram



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



CCT = 3266K
CIE x = 0.4195
CIE y = 0.3983
Duv = 0.0004

Point lies inside the ANSI 3500K 7-step quadrangle

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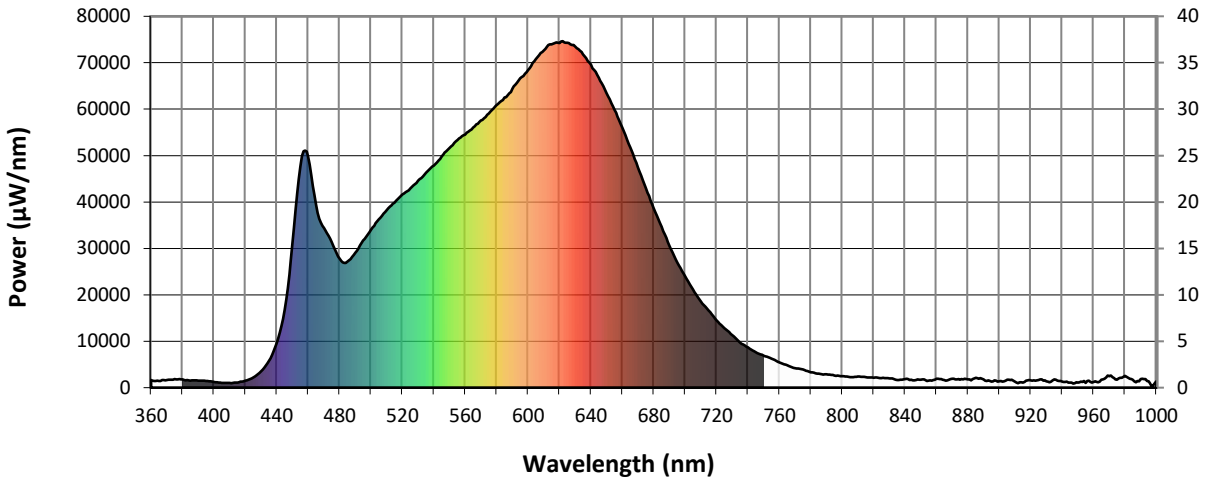
Photopic Flux vs. Wavelength



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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	1629	NR	490	29053	NR	620	74209	NR	750	6888	NR	880	1748	NR
365	1454	NR	495	31666	NR	625	74272	NR	755	6228	NR	885	2090	NR
370	1629	NR	500	34017	NR	630	73480	NR	760	5422	NR	890	1758	NR
375	1858	NR	505	36249	NR	635	71830	NR	765	4797	NR	895	1314	NR
380	1749	NR	510	38217	NR	640	69587	NR	770	4188	NR	900	1396	NR
385	1536	NR	515	39860	NR	645	66732	NR	775	3908	NR	905	1719	NR
390	1529	NR	520	41609	NR	650	63415	NR	780	3310	NR	910	1294	NR
395	1463	NR	525	42891	NR	655	59840	NR	785	2985	NR	915	1111	NR
400	1224	NR	530	44613	NR	660	56027	NR	790	2855	NR	920	1575	NR
405	1043	NR	535	46325	NR	665	51741	NR	795	2630	NR	925	1667	NR
410	987	NR	540	47843	NR	670	47426	NR	800	2493	NR	930	1367	NR
415	1121	NR	545	49858	NR	675	42932	NR	805	2287	NR	935	1770	NR
420	1486	NR	550	51603	NR	680	38693	NR	810	2365	NR	940	1320	NR
425	2215	NR	555	53318	NR	685	34666	NR	815	2293	NR	945	1116	NR
430	3506	NR	560	54494	NR	690	30616	NR	820	2133	NR	950	1061	NR
435	5766	NR	565	56036	NR	695	26969	NR	825	2062	NR	955	1031	NR
440	9588	NR	570	57542	NR	700	24034	NR	830	1984	NR	960	1226	NR
445	16724	NR	575	59048	NR	705	21175	NR	835	1661	NR	965	1706	NR
450	30943	NR	580	60878	NR	710	18518	NR	840	1876	NR	970	2450	NR
455	47636	NR	585	62497	NR	715	16588	NR	845	1600	NR	975	1734	NR
460	49838	NR	590	64427	NR	720	14496	NR	850	1696	NR	980	2566	NR
465	39446	NR	595	66624	NR	725	12823	NR	855	1520	NR	985	1729	NR
470	34419	NR	600	68452	NR	730	11311	NR	860	1911	NR	990	1841	NR
475	31320	NR	605	70794	NR	735	9697	NR	865	1622	NR	995	1376	NR
480	27788	NR	610	72666	NR	740	8643	NR	870	1892	NR	1000	1354	NR
485	27149	NR	615	73950	NR	745	7625	NR	875	1742	NR			

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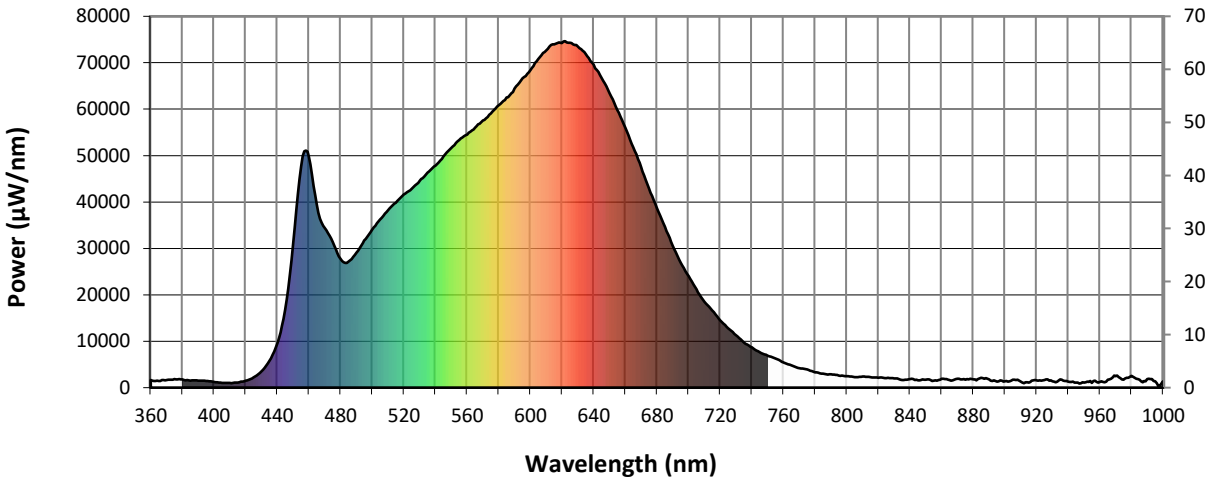
Scotopic Flux vs. Wavelength



Scotopic Lumens: 6226 **S/P: 1.58**

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	1629	NR	490	29053	NR	620	74209	NR	750	6888	NR	880	1748	NR
365	1454	NR	495	31666	NR	625	74272	NR	755	6228	NR	885	2090	NR
370	1629	NR	500	34017	NR	630	73480	NR	760	5422	NR	890	1758	NR
375	1858	NR	505	36249	NR	635	71830	NR	765	4797	NR	895	1314	NR
380	1749	NR	510	38217	NR	640	69587	NR	770	4188	NR	900	1396	NR
385	1536	NR	515	39860	NR	645	66732	NR	775	3908	NR	905	1719	NR
390	1529	NR	520	41609	NR	650	63415	NR	780	3310	NR	910	1294	NR
395	1463	NR	525	42891	NR	655	59840	NR	785	2985	NR	915	1111	NR
400	1224	NR	530	44613	NR	660	56027	NR	790	2855	NR	920	1575	NR
405	1043	NR	535	46325	NR	665	51741	NR	795	2630	NR	925	1667	NR
410	987	NR	540	47843	NR	670	47426	NR	800	2493	NR	930	1367	NR
415	1121	NR	545	49858	NR	675	42932	NR	805	2287	NR	935	1770	NR
420	1486	NR	550	51603	NR	680	38693	NR	810	2365	NR	940	1320	NR
425	2215	NR	555	53318	NR	685	34666	NR	815	2293	NR	945	1116	NR
430	3506	NR	560	54494	NR	690	30616	NR	820	2133	NR	950	1061	NR
435	5766	NR	565	56036	NR	695	26969	NR	825	2062	NR	955	1031	NR
440	9588	NR	570	57542	NR	700	24034	NR	830	1984	NR	960	1226	NR
445	16724	NR	575	59048	NR	705	21175	NR	835	1661	NR	965	1706	NR
450	30943	NR	580	60878	NR	710	18518	NR	840	1876	NR	970	2450	NR
455	47636	NR	585	62497	NR	715	16588	NR	845	1600	NR	975	1734	NR
460	49838	NR	590	64427	NR	720	14496	NR	850	1696	NR	980	2566	NR
465	39446	NR	595	66624	NR	725	12823	NR	855	1520	NR	985	1729	NR
470	34419	NR	600	68452	NR	730	11311	NR	860	1911	NR	990	1841	NR
475	31320	NR	605	70794	NR	735	9697	NR	865	1622	NR	995	1376	NR
480	27788	NR	610	72666	NR	740	8643	NR	870	1892	NR	1000	1354	NR
485	27149	NR	615	73950	NR	745	7625	NR	875	1742	NR			

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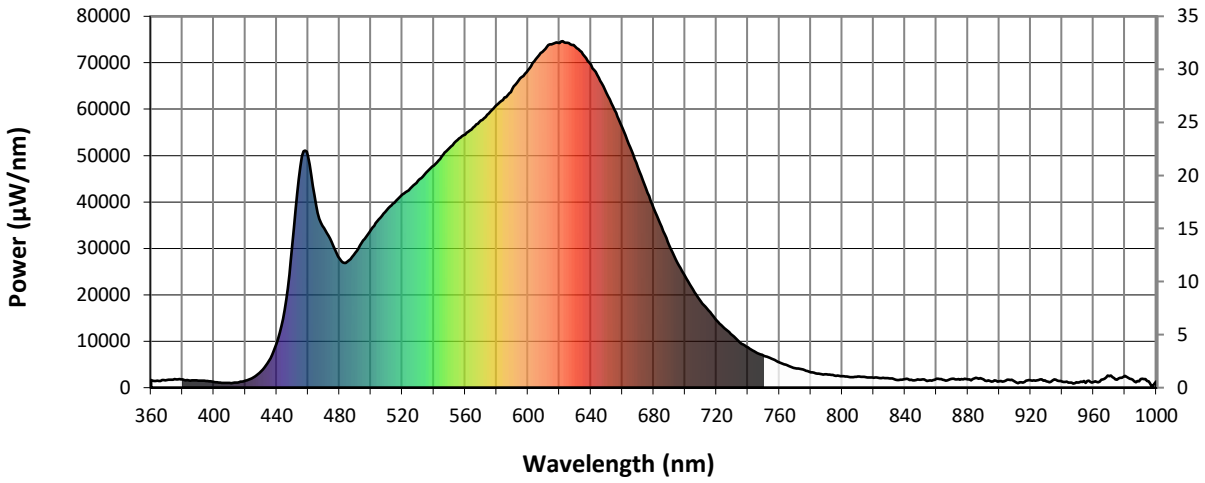
Melanopic Flux vs. Wavelength



Melanopic Lumens: 2506.4 **M/P: 0.64**

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	1629	NR	490	29053	NR	620	74209	NR	750	6888	NR	880	1748	NR
365	1454	NR	495	31666	NR	625	74272	NR	755	6228	NR	885	2090	NR
370	1629	NR	500	34017	NR	630	73480	NR	760	5422	NR	890	1758	NR
375	1858	NR	505	36249	NR	635	71830	NR	765	4797	NR	895	1314	NR
380	1749	NR	510	38217	NR	640	69587	NR	770	4188	NR	900	1396	NR
385	1536	NR	515	39860	NR	645	66732	NR	775	3908	NR	905	1719	NR
390	1529	NR	520	41609	NR	650	63415	NR	780	3310	NR	910	1294	NR
395	1463	NR	525	42891	NR	655	59840	NR	785	2985	NR	915	1111	NR
400	1224	NR	530	44613	NR	660	56027	NR	790	2855	NR	920	1575	NR
405	1043	NR	535	46325	NR	665	51741	NR	795	2630	NR	925	1667	NR
410	987	NR	540	47843	NR	670	47426	NR	800	2493	NR	930	1367	NR
415	1121	NR	545	49858	NR	675	42932	NR	805	2287	NR	935	1770	NR
420	1486	NR	550	51603	NR	680	38693	NR	810	2365	NR	940	1320	NR
425	2215	NR	555	53318	NR	685	34666	NR	815	2293	NR	945	1116	NR
430	3506	NR	560	54494	NR	690	30616	NR	820	2133	NR	950	1061	NR
435	5766	NR	565	56036	NR	695	26969	NR	825	2062	NR	955	1031	NR
440	9588	NR	570	57542	NR	700	24034	NR	830	1984	NR	960	1226	NR
445	16724	NR	575	59048	NR	705	21175	NR	835	1661	NR	965	1706	NR
450	30943	NR	580	60878	NR	710	18518	NR	840	1876	NR	970	2450	NR
455	47636	NR	585	62497	NR	715	16588	NR	845	1600	NR	975	1734	NR
460	49838	NR	590	64427	NR	720	14496	NR	850	1696	NR	980	2566	NR
465	39446	NR	595	66624	NR	725	12823	NR	855	1520	NR	985	1729	NR
470	34419	NR	600	68452	NR	730	11311	NR	860	1911	NR	990	1841	NR
475	31320	NR	605	70794	NR	735	9697	NR	865	1622	NR	995	1376	NR
480	27788	NR	610	72666	NR	740	8643	NR	870	1892	NR	1000	1354	NR
485	27149	NR	615	73950	NR	745	7625	NR	875	1742	NR			

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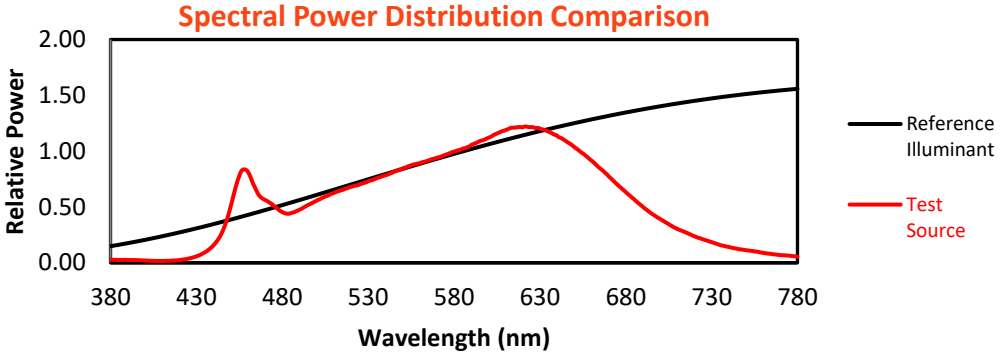
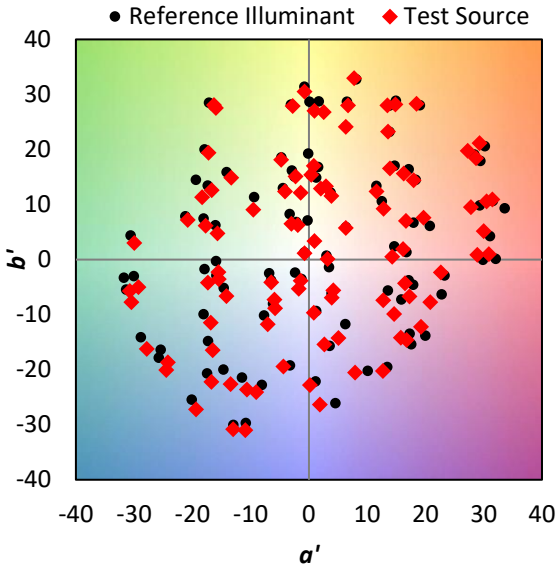
Summary

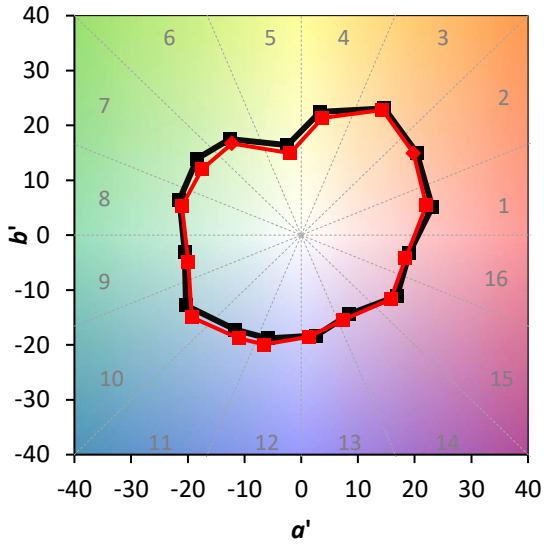
R_f = 89.7
R_g = 96
CIE R_a = 94.3
R_9 = 70.9

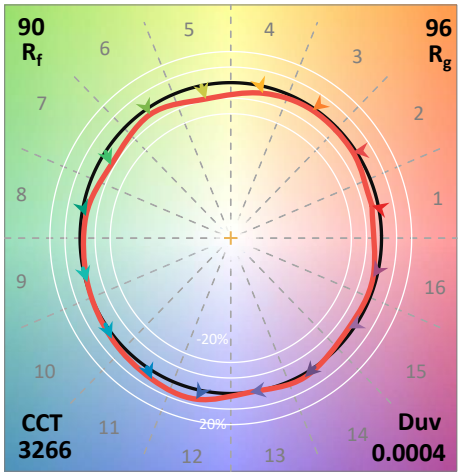
Spectral Power Distribution Comparison

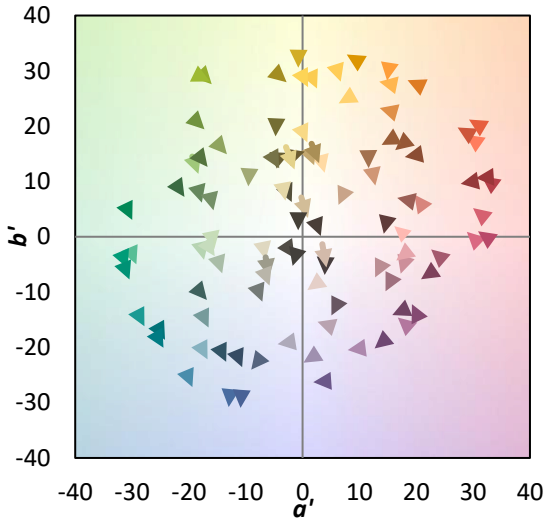


Color Vector Graphics









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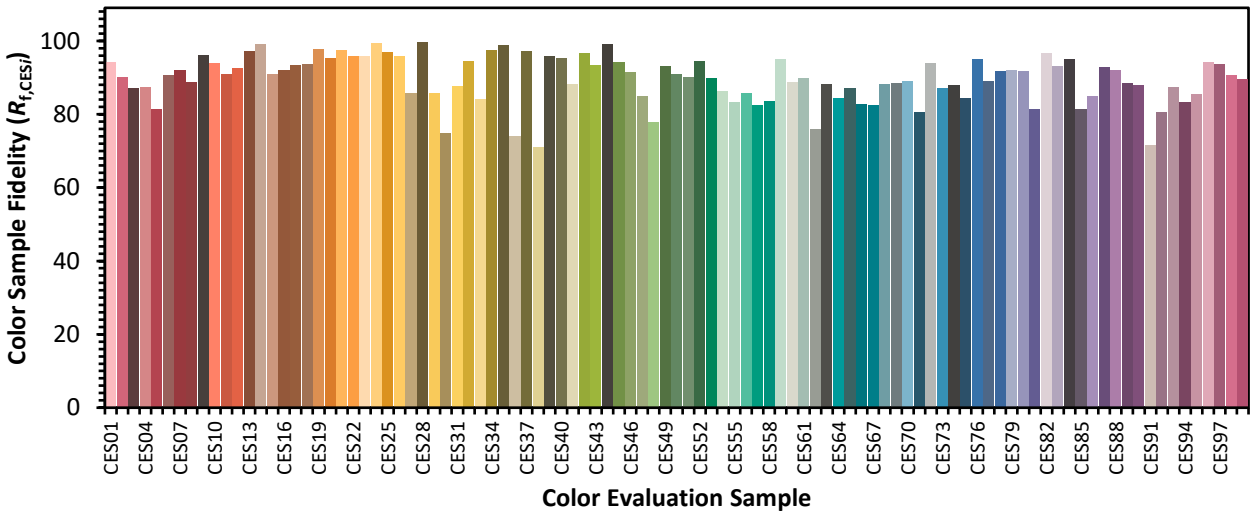
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 96	CES51 = 90	CES76 = 95
CES02 = 63	CES27 = 86	CES52 = 94	CES77 = 89
CES03 = 32	CES28 = 100	CES53 = 90	CES78 = 92
CES04 = 70	CES29 = 86	CES54 = 86	CES79 = 92
CES05 = 50	CES30 = 75	CES55 = 83	CES80 = 92
CES06 = 51	CES31 = 88	CES56 = 86	CES81 = 81
CES07 = 43	CES32 = 94	CES57 = 83	CES82 = 97
CES08 = 42	CES33 = 84	CES58 = 83	CES83 = 93
CES09 = 29	CES34 = 98	CES59 = 95	CES84 = 95
CES10 = 75	CES35 = 99	CES60 = 89	CES85 = 81
CES11 = 58	CES36 = 74	CES61 = 90	CES86 = 85
CES12 = 64	CES37 = 97	CES62 = 76	CES87 = 93
CES13 = 44	CES38 = 71	CES63 = 88	CES88 = 92
CES14 = 74	CES39 = 96	CES64 = 84	CES89 = 88
CES15 = 72	CES40 = 95	CES65 = 87	CES90 = 88
CES16 = 48	CES41 = 88	CES66 = 83	CES91 = 71
CES17 = 50	CES42 = 97	CES67 = 83	CES92 = 80
CES18 = 56	CES43 = 93	CES68 = 88	CES93 = 87
CES19 = 71	CES44 = 99	CES69 = 89	CES94 = 83
CES20 = 67	CES45 = 94	CES70 = 89	CES95 = 85
CES21 = 86	CES46 = 92	CES71 = 81	CES96 = 94
CES22 = 78	CES47 = 85	CES72 = 94	CES97 = 94
CES23 = 91	CES48 = 78	CES73 = 87	CES98 = 91
CES24 = 90	CES49 = 93	CES74 = 88	CES99 = 90
CES25 = 71	CES50 = 91	CES75 = 85	



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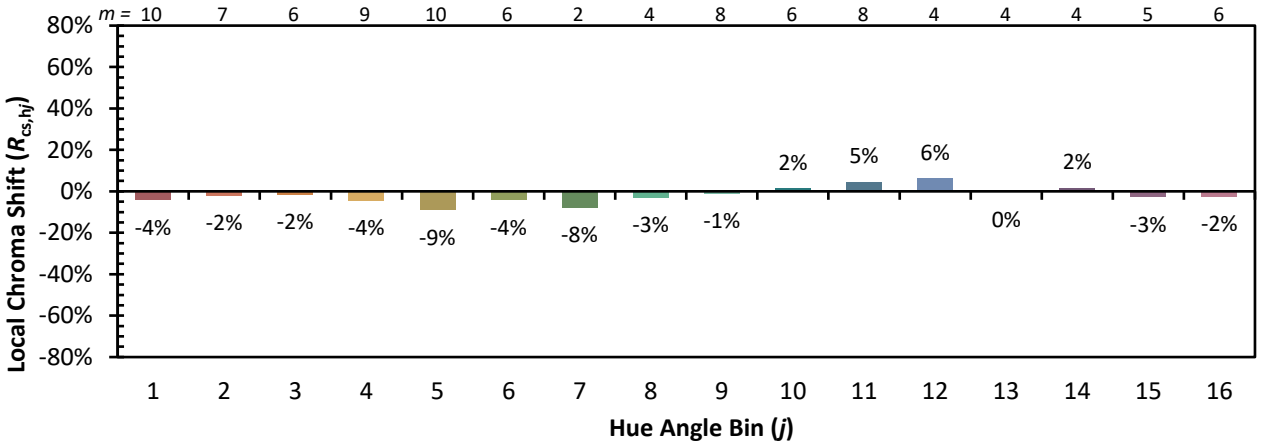
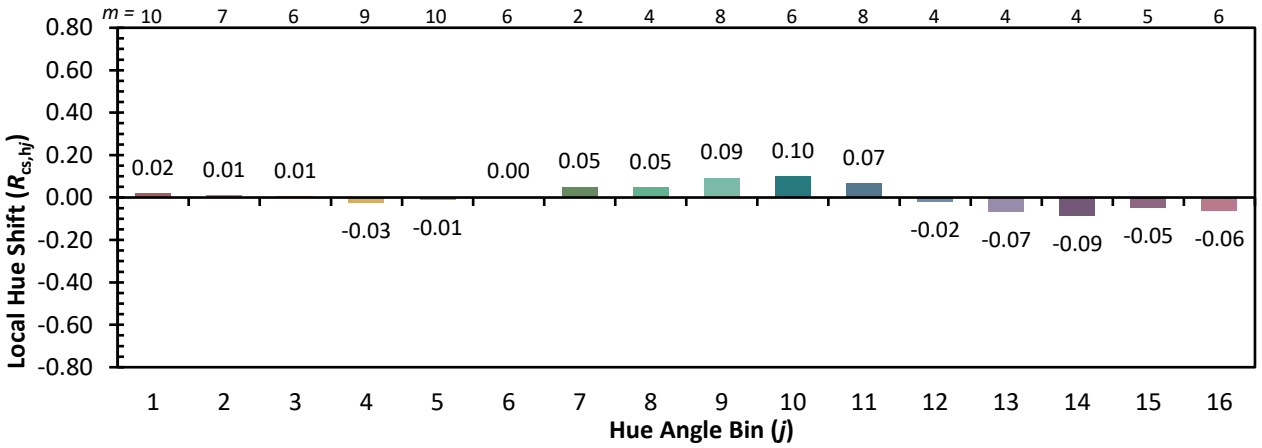
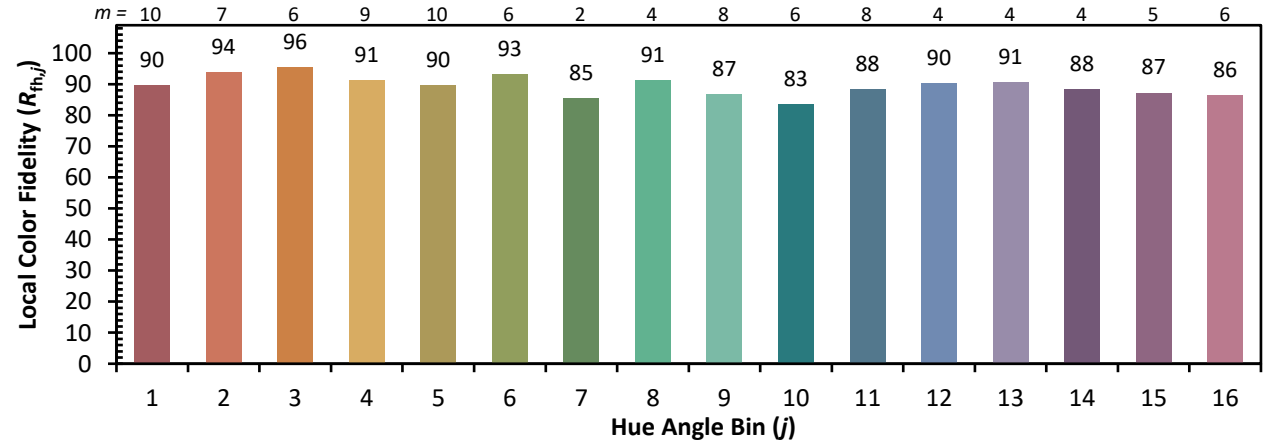
Color Rendition by Hue-Angle Bin







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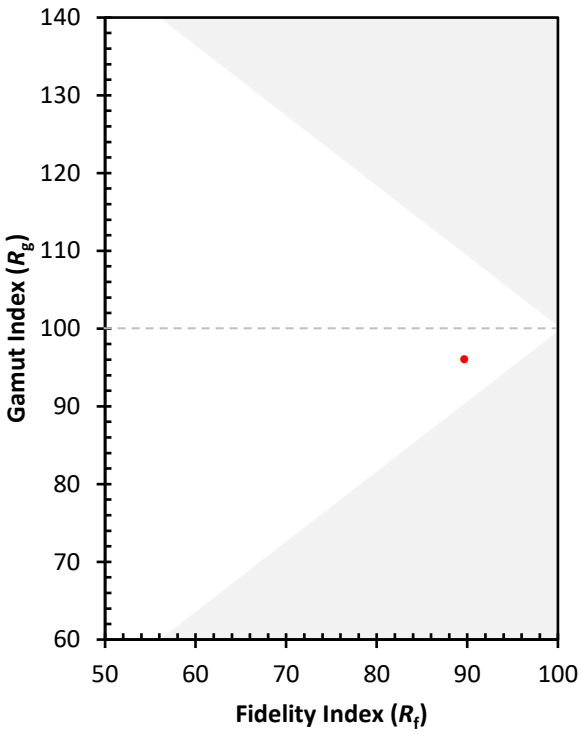
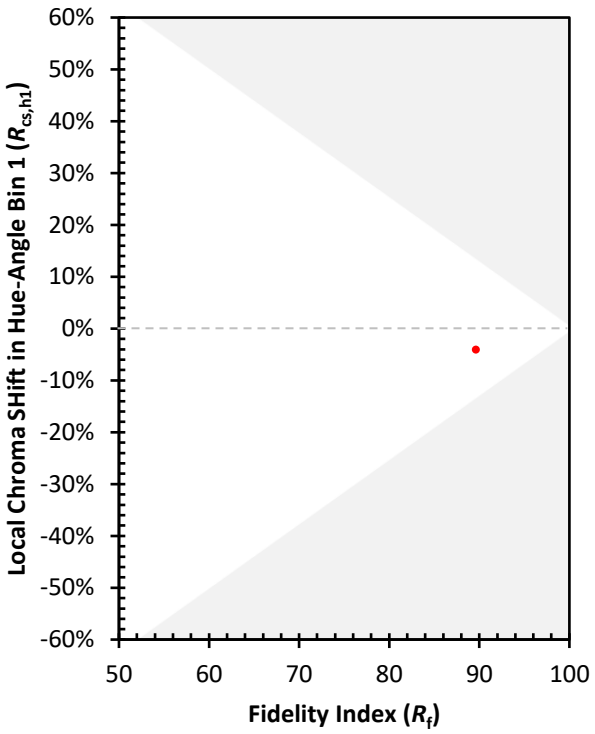
Measure Comparisons





(END OF REPORT)