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: P78472

Luminaire Tested: **DFN2DIP-RG3F0-030D050US940-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:	P78472
	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-RG3F0-030D050US940-FLL-FLL-1DUDD-W
Description:	Define Geo Ring 3ft Diameter Direct/Indirect Fixture w/ Frosted Lens
Light Source:	4000K CCT, 90 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	8022.6 lumens
Efficiency:	N/A
Efficacy:	90.5 lumens/watt
Spacing Criteria (0/90/45):	1.11 / 1.11 / 1.21
Luminous Opening:	Circular (Dia: 3' x H: 0')
CIE Type:	Semi-Indirect

Input Watts (W):	88.6
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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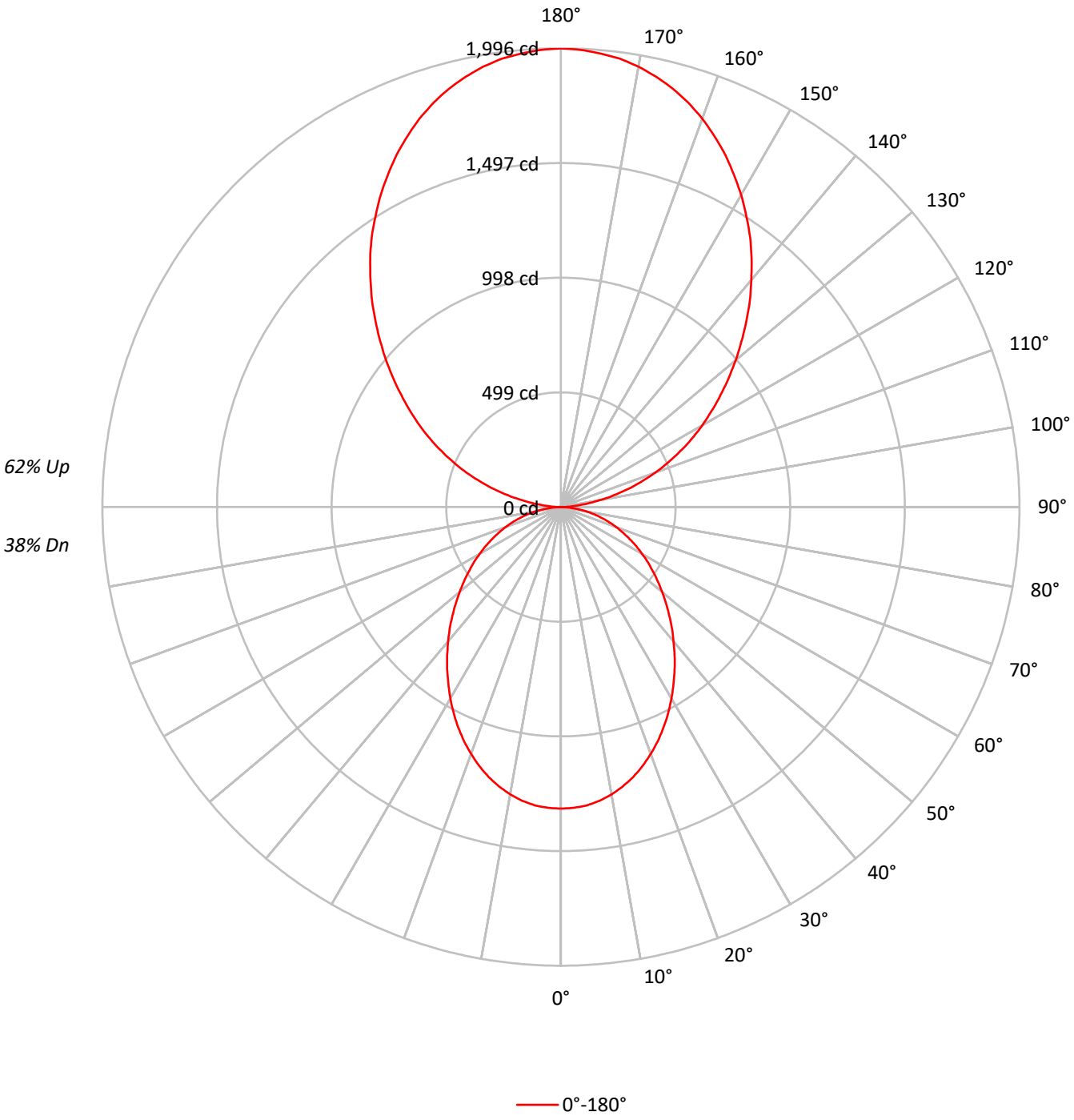
TEST NUMBER: P78472
CATALOG NUMBER: DFN2DIP-RG3F0-030D050US940-FLL-FLL-1DUDD-W

Luminous Intensity Polar Plot



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CATALOG NUMBER: DFN2DIP-RG3F0-030D050US940-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	104	104	104	104	95	95	95	95	76	76	76	60	60	60	45	45	45	38
1	95	91	87	84	86	83	79	76	67	65	63	53	51	50	40	39	38	32
2	87	79	73	68	78	72	67	63	59	55	52	46	44	42	35	33	32	27
3	79	70	63	57	71	64	58	53	52	48	44	41	38	36	31	29	27	23
4	72	62	54	48	65	56	50	45	46	41	37	37	33	30	28	26	24	20
5	66	55	47	41	60	50	43	38	41	36	32	33	29	26	25	23	21	17
6	61	49	42	36	55	45	38	33	37	32	28	30	26	23	23	20	18	15
7	57	45	37	31	51	41	34	29	34	29	25	27	23	21	21	18	16	14
8	52	40	33	28	48	37	30	26	31	26	22	25	21	18	19	17	15	12
9	49	37	30	25	44	34	27	23	28	23	20	23	19	16	18	15	13	11
10	46	34	27	22	41	31	25	21	26	21	18	21	17	15	17	14	12	10

AVERAGE LUMINANCE (cd/sqm):

	0°
0°	1998
5°	1992
10°	1964
15°	1917
20°	1852
25°	1778
30°	1692
35°	1604
40°	1517
45°	1436
50°	1362
55°	1298
60°	1243
65°	1193
70°	1144
75°	1083
80°	1008
85°	786

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	123.3	1.5
10°-20°	341.8	4.3
20°-30°	486.3	6.1
30°-40°	539.5	6.7
40°-50°	515.5	6.4
50°-60°	438.7	5.5
60°-70°	328.5	4.1
70°-80°	195.4	2.4
80°-90°	54.5	0.7
90°-100°	80.8	1.0
100°-110°	319.1	4.0
110°-120°	566.1	7.1
120°-130°	759.1	9.5
130°-140°	880.6	11.0
140°-150°	896.4	11.2
150°-160°	778.3	9.7
160°-170°	530.7	6.6
170°-180°	188.0	2.3
0°-30°	951.4	11.9
0°-40°	1490.9	18.6
0°-60°	2445.2	30.5
0°-90°	3023.5	37.7
90°-120°	966.0	12.0
90°-150°	3502.0	43.7
90°-180°	4999.0	62.3
0°-180°	8022.6	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	1312	
5°	1303	123
15°	1216	342
25°	1058	486
35°	863	539
45°	667	516
55°	489	439
65°	331	328
75°	184	195
85°	45	52
90°	2	7
95°	66	77
105°	302	319
115°	572	566
125°	848	759
135°	1141	881
145°	1436	896
155°	1692	778
165°	1884	531
175°	1981	188
180°	1996	

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CANDELA DISTRIBUTION (FULL):

	0°
0°	1312.0
2.5°	1310.0
5°	1303.0
7.5°	1289.0
10°	1270.0
12.5°	1245.0
15°	1216.0
17.5°	1182.0
20°	1143.0
22.5°	1102.0
25°	1058.0
27.5°	1011.0
30°	962.0
32.5°	912.0
35°	863.0
37.5°	813.0
40°	763.0
42.5°	716.0
45°	667.0
47.5°	621.0
50°	575.0
52.5°	532.0
55°	489.0
57.5°	450.0
60°	408.0
62.5°	370.0
65°	331.0
67.5°	294.0
70°	257.0
72.5°	221.0
75°	184.0
77.5°	150.0
80°	115.0
82.5°	80.0
85°	45.0
87.5°	17.0
90°	1.5
92.5°	27.9
95°	66.0
97.5°	115.8
100°	173.0
102.5°	236.1
105°	302.1
107.5°	368.0
110°	435.5

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CANDELA DISTRIBUTION (continued):

	0°
112.5°	502.9
115°	571.8
117.5°	640.8
120°	709.7
122.5°	777.1
125°	847.5
127.5°	919.4
130°	992.7
132.5°	1066.0
135°	1140.8
137.5°	1217.0
140°	1288.9
142.5°	1363.6
145°	1435.5
147.5°	1501.5
150°	1568.9
152.5°	1630.5
155°	1692.1
157.5°	1746.3
160°	1799.1
162.5°	1844.6
165°	1884.2
167.5°	1917.9
170°	1945.7
172.5°	1967.7
175°	1980.9
177.5°	1991.2
180°	1995.6

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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: SP1-2401-290-4

Test Date: 01/19/2024

Luminaire Tested: RNG2DIP-RG2F0-020D020US940-FLL-FLL-1-D-UDD-W

Data in this report applies to families of products including RNG2DIP-RG2F0-020D020US940-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

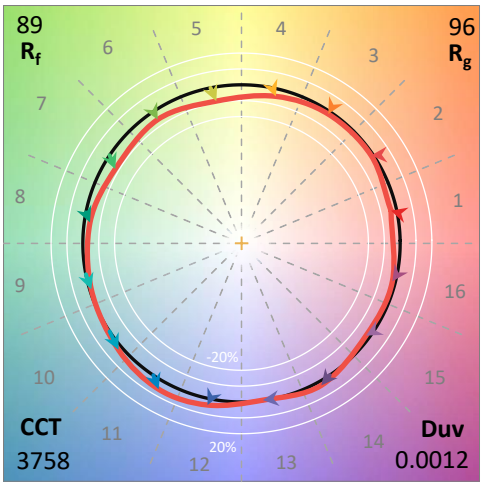
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2401-290-4
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-RG2F0-020D020US940-FLL-FLL-1-D-UDD-W**
Description:	2' RING DIRECT/INDIRECT FIXTURE WITH FROSTED LIGHT LEVEL 1

Spectral Parameters

CCT (K):	3758	CRI (Ra):	94.5		
CIE u':	0.2291	R1:	96.0	R9:	76.6
CIE v':	0.5077	R2:	99.4	R10:	97.1
Duv:	0.0012	R3:	98.5	R11:	92.7
CIE x:	0.3927	R4:	91.3	R12:	73.3
CIE y:	0.3866	R5:	93.7	R13:	97.5
CIE z:	0.2207	R6:	96.5	R14:	99.6
Peak Wavelength (nm):	622	R7:	92.4		
Dominant Wavelength (nm):	579	R8:	88.3		
Purity:	34				

Rf:	89
Rg:	95.5



Test Conditions

Stabilization Time:	24M
Operation Time:	12H
Room Temperature (°C) / RH%:	25.6/27%
Sphere Temperature (°C):	25.0

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REPORT NUMBER: SP1-2401-290-4

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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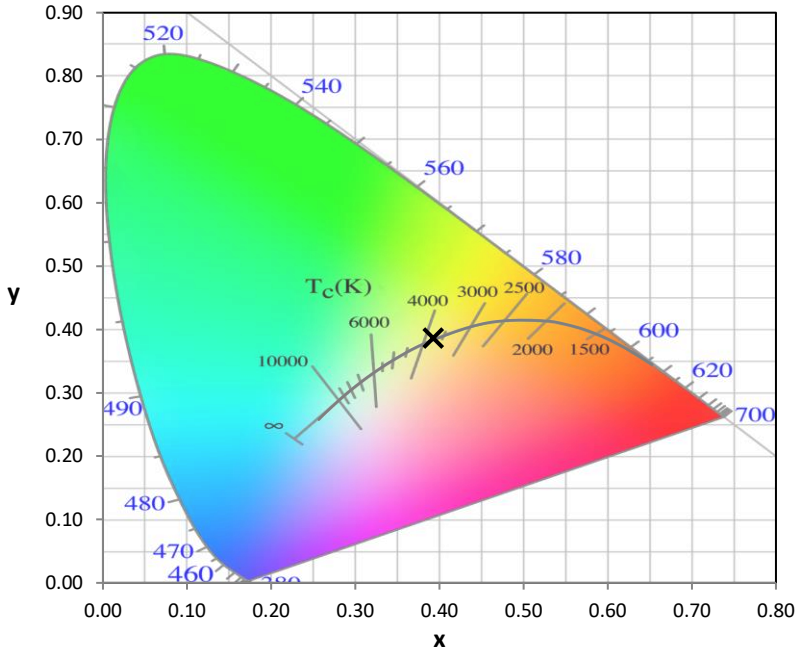
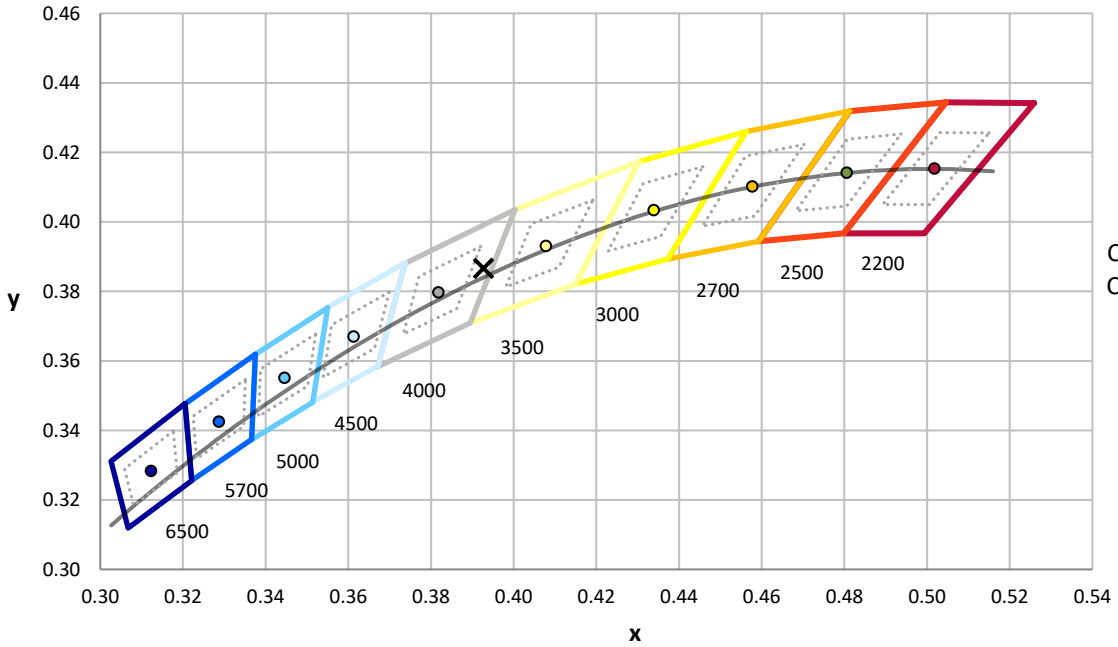
CIE 1931 Chromaticity Diagram



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



CCT = 3758K
CIE x = 0.3927
CIE y = 0.3866
Duv = 0.0012

Point lies inside the ANSI 4000K 7-step quadrangle

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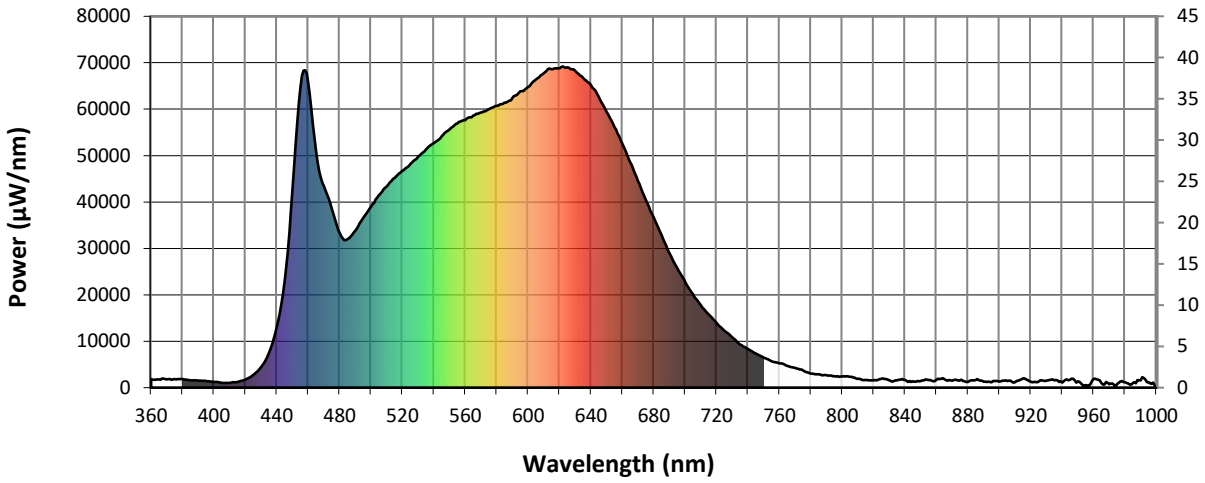
Photopic Flux vs. Wavelength



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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	1835	NR	490	33863	NR	620	68794	NR	750	6489	NR	880	1195	NR
365	1756	NR	495	36543	NR	625	68963	NR	755	5711	NR	885	1624	NR
370	1802	NR	500	39024	NR	630	68221	NR	760	5217	NR	890	1275	NR
375	1845	NR	505	41399	NR	635	66761	NR	765	4671	NR	895	1184	NR
380	1842	NR	510	43372	NR	640	65207	NR	770	4277	NR	900	1288	NR
385	1553	NR	515	45125	NR	645	62607	NR	775	3684	NR	905	1449	NR
390	1519	NR	520	46728	NR	650	59420	NR	780	3015	NR	910	1184	NR
395	1452	NR	525	48116	NR	655	56103	NR	785	2857	NR	915	1999	NR
400	1256	NR	530	49751	NR	660	52566	NR	790	2657	NR	920	1299	NR
405	1033	NR	535	51317	NR	665	48489	NR	795	2474	NR	925	1312	NR
410	1023	NR	540	52637	NR	670	44555	NR	800	2413	NR	930	1526	NR
415	1228	NR	545	54148	NR	675	40405	NR	805	2307	NR	935	1577	NR
420	1723	NR	550	55654	NR	680	36707	NR	810	1935	NR	940	1108	NR
425	2748	NR	555	56944	NR	685	32841	NR	815	1648	NR	945	1728	NR
430	4401	NR	560	57653	NR	690	29037	NR	820	1582	NR	950	1356	NR
435	7516	NR	565	58559	NR	695	25745	NR	825	1937	NR	955	564	NR
440	12984	NR	570	59300	NR	700	22850	NR	830	1558	NR	960	1914	NR
445	22972	NR	575	59941	NR	705	20102	NR	835	1584	NR	965	994	NR
450	42364	NR	580	60752	NR	710	17680	NR	840	1621	NR	970	757	NR
455	64528	NR	585	61417	NR	715	15746	NR	845	1333	NR	975	758	NR
460	65971	NR	590	62430	NR	720	13934	NR	850	1406	NR	980	1163	NR
465	51026	NR	595	63801	NR	725	12285	NR	855	1655	NR	985	952	NR
470	43331	NR	600	64806	NR	730	10834	NR	860	1737	NR	990	1604	NR
475	38626	NR	605	66352	NR	735	9292	NR	865	1841	NR	995	1145	NR
480	33315	NR	610	67770	NR	740	8312	NR	870	1490	NR	1000	0	NR
485	31961	NR	615	68560	NR	745	7359	NR	875	1559	NR			

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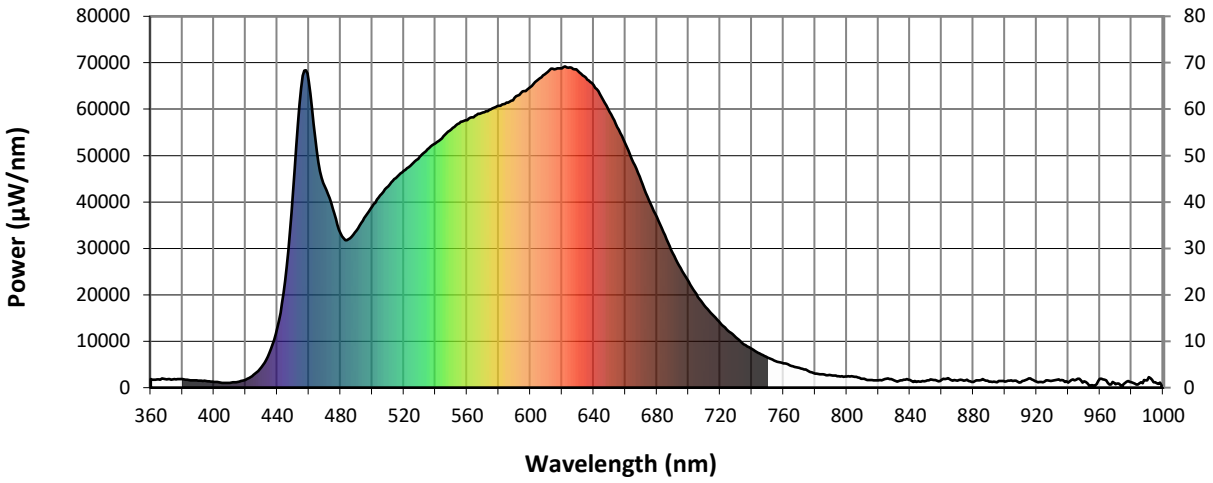
REPORT NUMBER: SP1-2401-290-4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 7174.5 **S/P: 1.77**

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	1835	NR	490	33863	NR	620	68794	NR	750	6489	NR	880	1195	NR
365	1756	NR	495	36543	NR	625	68963	NR	755	5711	NR	885	1624	NR
370	1802	NR	500	39024	NR	630	68221	NR	760	5217	NR	890	1275	NR
375	1845	NR	505	41399	NR	635	66761	NR	765	4671	NR	895	1184	NR
380	1842	NR	510	43372	NR	640	65207	NR	770	4277	NR	900	1288	NR
385	1553	NR	515	45125	NR	645	62607	NR	775	3684	NR	905	1449	NR
390	1519	NR	520	46728	NR	650	59420	NR	780	3015	NR	910	1184	NR
395	1452	NR	525	48116	NR	655	56103	NR	785	2857	NR	915	1999	NR
400	1256	NR	530	49751	NR	660	52566	NR	790	2657	NR	920	1299	NR
405	1033	NR	535	51317	NR	665	48489	NR	795	2474	NR	925	1312	NR
410	1023	NR	540	52637	NR	670	44555	NR	800	2413	NR	930	1526	NR
415	1228	NR	545	54148	NR	675	40405	NR	805	2307	NR	935	1577	NR
420	1723	NR	550	55654	NR	680	36707	NR	810	1935	NR	940	1108	NR
425	2748	NR	555	56944	NR	685	32841	NR	815	1648	NR	945	1728	NR
430	4401	NR	560	57653	NR	690	29037	NR	820	1582	NR	950	1356	NR
435	7516	NR	565	58559	NR	695	25745	NR	825	1937	NR	955	564	NR
440	12984	NR	570	59300	NR	700	22850	NR	830	1558	NR	960	1914	NR
445	22972	NR	575	59941	NR	705	20102	NR	835	1584	NR	965	994	NR
450	42364	NR	580	60752	NR	710	17680	NR	840	1621	NR	970	757	NR
455	64528	NR	585	61417	NR	715	15746	NR	845	1333	NR	975	758	NR
460	65971	NR	590	62430	NR	720	13934	NR	850	1406	NR	980	1163	NR
465	51026	NR	595	63801	NR	725	12285	NR	855	1655	NR	985	952	NR
470	43331	NR	600	64806	NR	730	10834	NR	860	1737	NR	990	1604	NR
475	38626	NR	605	66352	NR	735	9292	NR	865	1841	NR	995	1145	NR
480	33315	NR	610	67770	NR	740	8312	NR	870	1490	NR	1000	0	NR
485	31961	NR	615	68560	NR	745	7359	NR	875	1559	NR			

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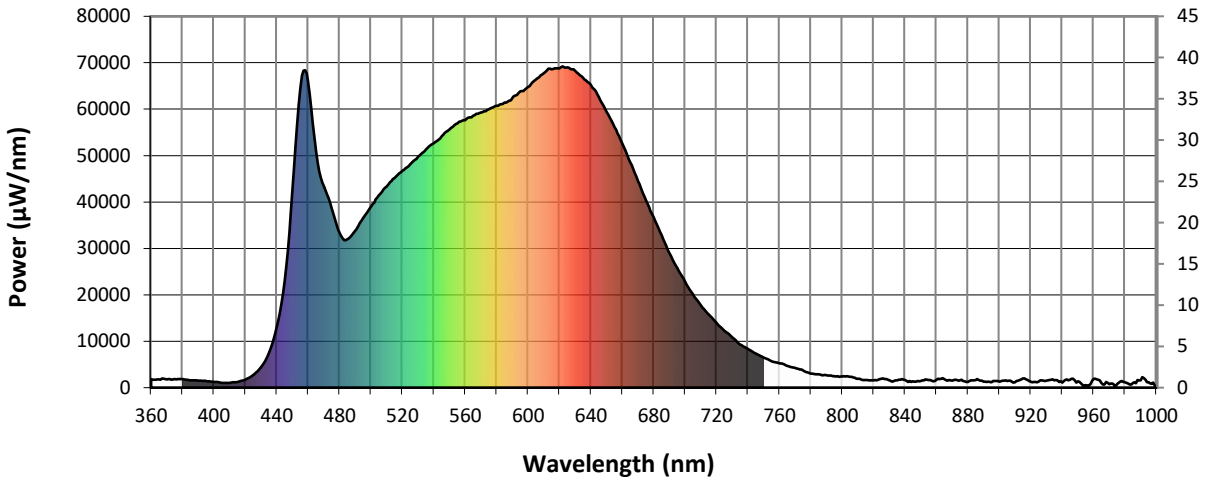
Melanopic Flux vs. Wavelength



Melanopic Lumens: 2971.3 **M/P: 0.73**

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	1835	NR	490	33863	NR	620	68794	NR	750	6489	NR	880	1195	NR
365	1756	NR	495	36543	NR	625	68963	NR	755	5711	NR	885	1624	NR
370	1802	NR	500	39024	NR	630	68221	NR	760	5217	NR	890	1275	NR
375	1845	NR	505	41399	NR	635	66761	NR	765	4671	NR	895	1184	NR
380	1842	NR	510	43372	NR	640	65207	NR	770	4277	NR	900	1288	NR
385	1553	NR	515	45125	NR	645	62607	NR	775	3684	NR	905	1449	NR
390	1519	NR	520	46728	NR	650	59420	NR	780	3015	NR	910	1184	NR
395	1452	NR	525	48116	NR	655	56103	NR	785	2857	NR	915	1999	NR
400	1256	NR	530	49751	NR	660	52566	NR	790	2657	NR	920	1299	NR
405	1033	NR	535	51317	NR	665	48489	NR	795	2474	NR	925	1312	NR
410	1023	NR	540	52637	NR	670	44555	NR	800	2413	NR	930	1526	NR
415	1228	NR	545	54148	NR	675	40405	NR	805	2307	NR	935	1577	NR
420	1723	NR	550	55654	NR	680	36707	NR	810	1935	NR	940	1108	NR
425	2748	NR	555	56944	NR	685	32841	NR	815	1648	NR	945	1728	NR
430	4401	NR	560	57653	NR	690	29037	NR	820	1582	NR	950	1356	NR
435	7516	NR	565	58559	NR	695	25745	NR	825	1937	NR	955	564	NR
440	12984	NR	570	59300	NR	700	22850	NR	830	1558	NR	960	1914	NR
445	22972	NR	575	59941	NR	705	20102	NR	835	1584	NR	965	994	NR
450	42364	NR	580	60752	NR	710	17680	NR	840	1621	NR	970	757	NR
455	64528	NR	585	61417	NR	715	15746	NR	845	1333	NR	975	758	NR
460	65971	NR	590	62430	NR	720	13934	NR	850	1406	NR	980	1163	NR
465	51026	NR	595	63801	NR	725	12285	NR	855	1655	NR	985	952	NR
470	43331	NR	600	64806	NR	730	10834	NR	860	1737	NR	990	1604	NR
475	38626	NR	605	66352	NR	735	9292	NR	865	1841	NR	995	1145	NR
480	33315	NR	610	67770	NR	740	8312	NR	870	1490	NR	1000	0	NR
485	31961	NR	615	68560	NR	745	7359	NR	875	1559	NR			

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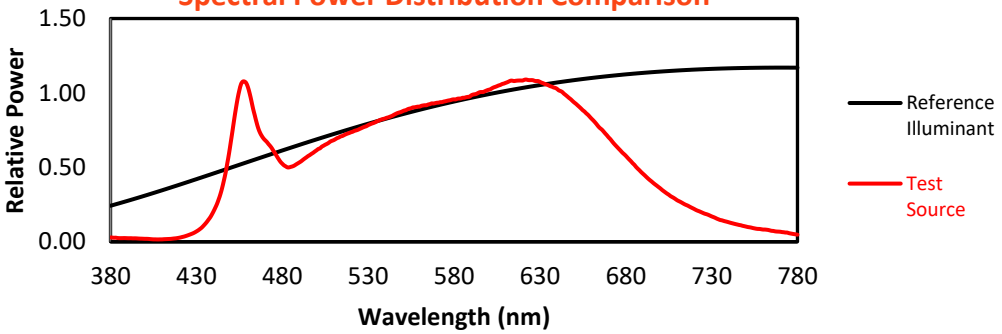
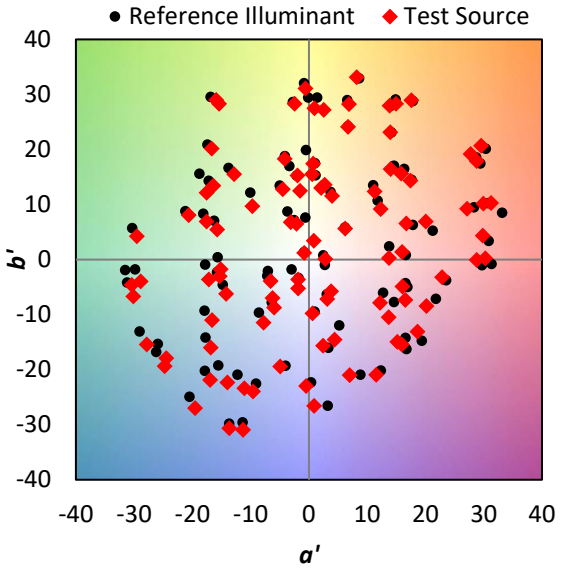
Summary

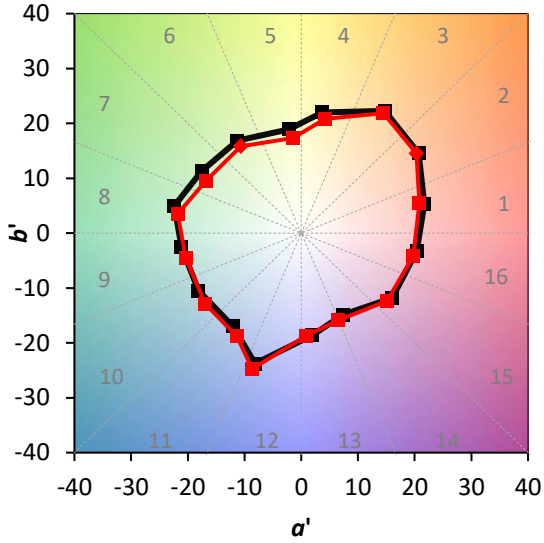
R_f = 89
R_g = 95.5
CIE R_a = 94.5
R_9 = 76.6

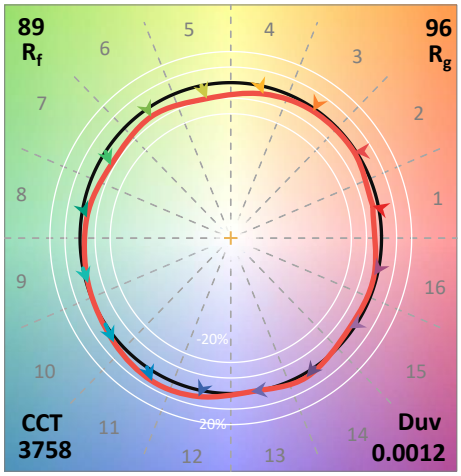
Spectral Power Distribution Comparison

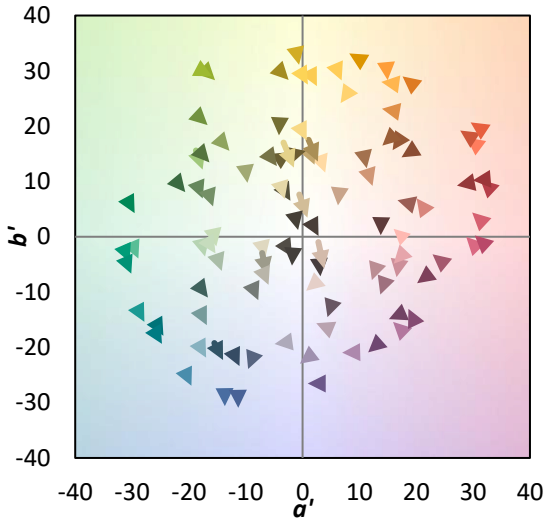


Color Vector Graphics









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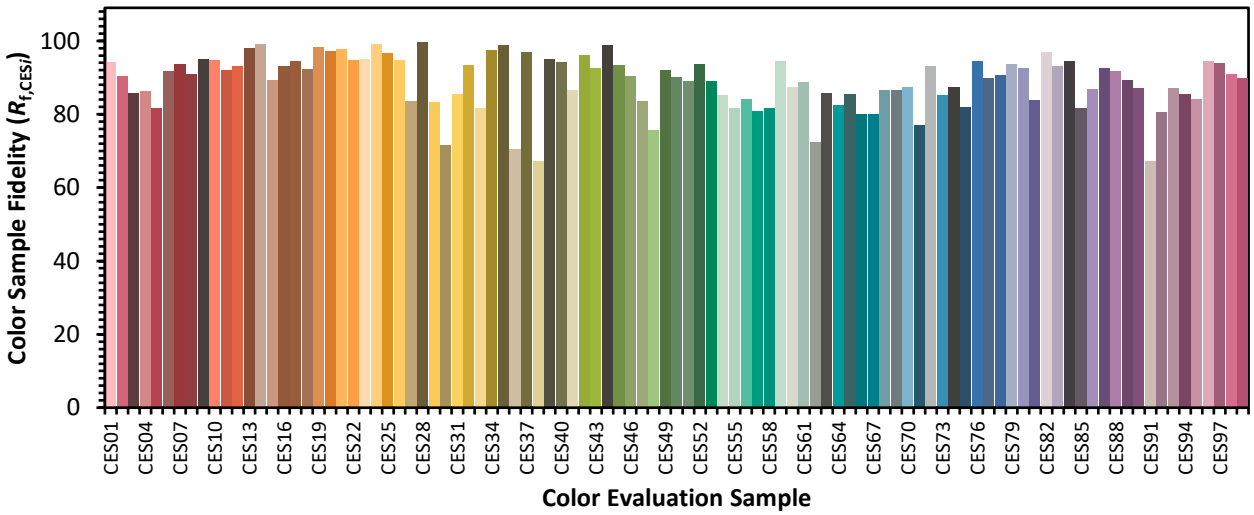
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 95	CES51 = 89	CES76 = 94
CES02 = 62	CES27 = 84	CES52 = 94	CES77 = 90
CES03 = 31	CES28 = 100	CES53 = 89	CES78 = 91
CES04 = 69	CES29 = 83	CES54 = 85	CES79 = 94
CES05 = 49	CES30 = 71	CES55 = 82	CES80 = 93
CES06 = 51	CES31 = 85	CES56 = 84	CES81 = 84
CES07 = 42	CES32 = 93	CES57 = 81	CES82 = 97
CES08 = 41	CES33 = 82	CES58 = 82	CES83 = 93
CES09 = 29	CES34 = 97	CES59 = 95	CES84 = 94
CES10 = 74	CES35 = 99	CES60 = 87	CES85 = 82
CES11 = 57	CES36 = 70	CES61 = 89	CES86 = 87
CES12 = 63	CES37 = 97	CES62 = 72	CES87 = 93
CES13 = 43	CES38 = 67	CES63 = 86	CES88 = 92
CES14 = 74	CES39 = 95	CES64 = 82	CES89 = 89
CES15 = 71	CES40 = 94	CES65 = 86	CES90 = 87
CES16 = 47	CES41 = 87	CES66 = 80	CES91 = 67
CES17 = 49	CES42 = 96	CES67 = 80	CES92 = 81
CES18 = 56	CES43 = 93	CES68 = 86	CES93 = 87
CES19 = 71	CES44 = 99	CES69 = 87	CES94 = 86
CES20 = 66	CES45 = 93	CES70 = 87	CES95 = 84
CES21 = 85	CES46 = 90	CES71 = 77	CES96 = 95
CES22 = 78	CES47 = 84	CES72 = 93	CES97 = 94
CES23 = 91	CES48 = 76	CES73 = 85	CES98 = 91
CES24 = 90	CES49 = 92	CES74 = 87	CES99 = 90
CES25 = 71	CES50 = 90	CES75 = 82	



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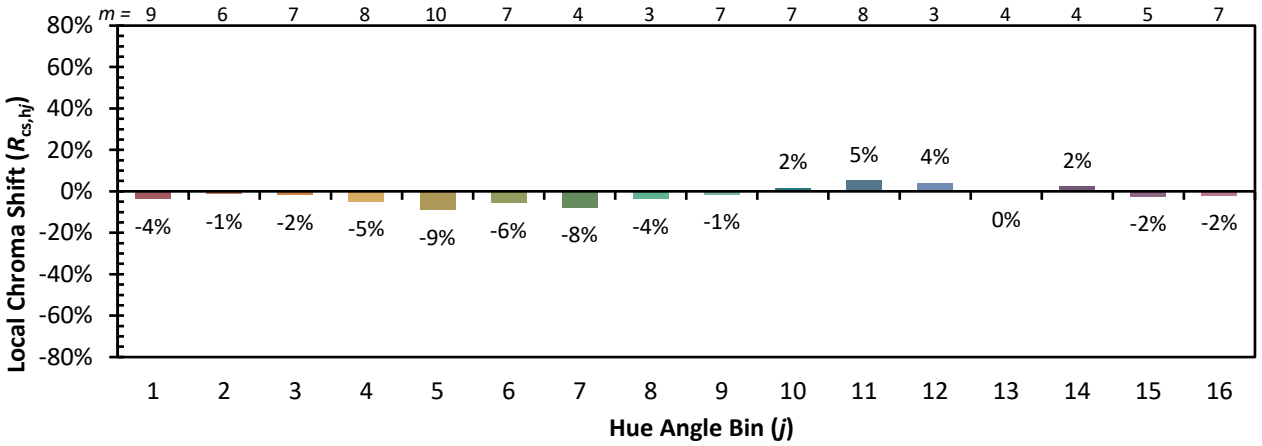
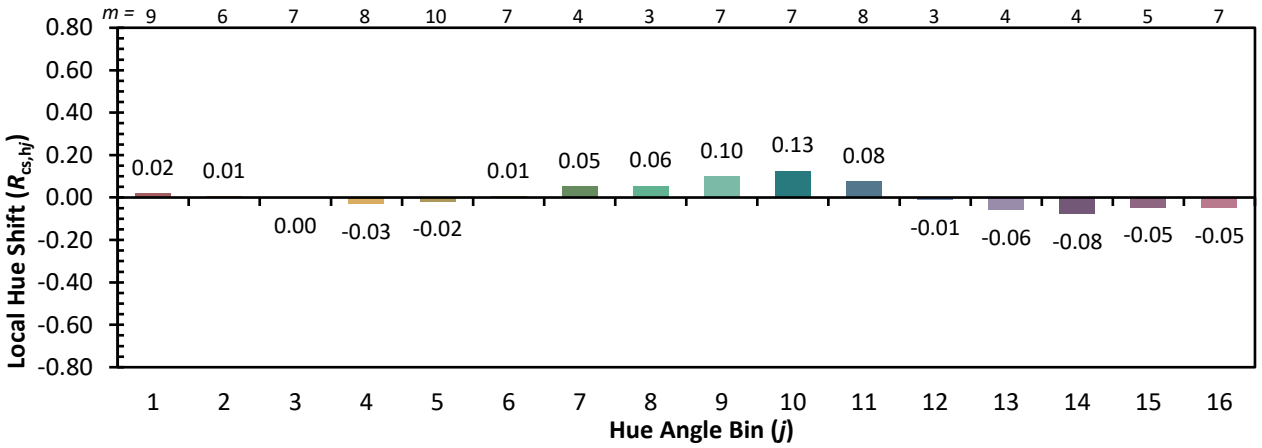
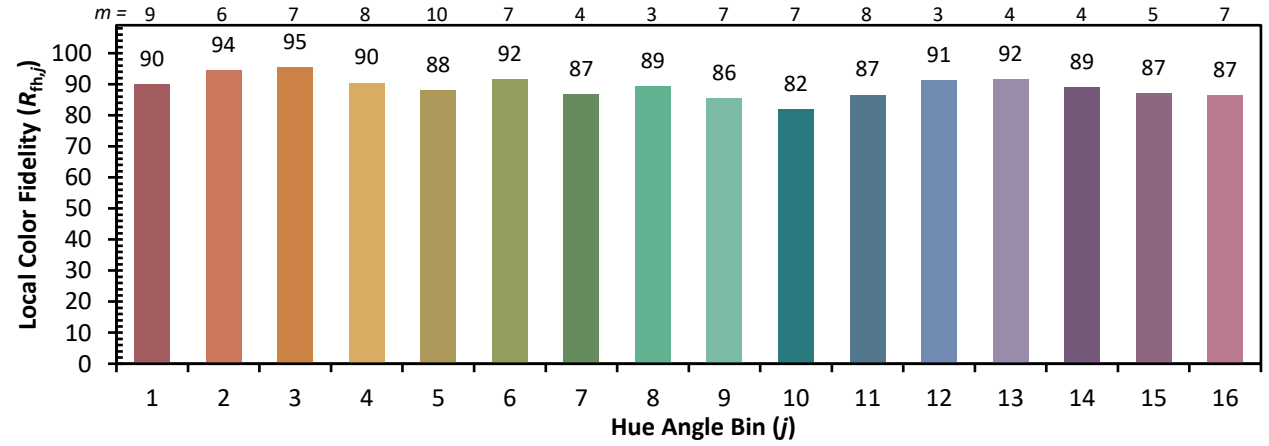
Color Rendition by Hue-Angle Bin







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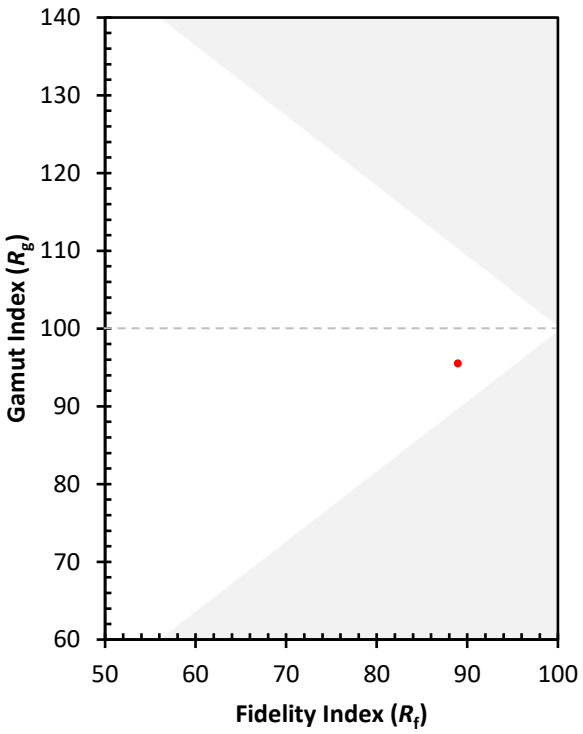
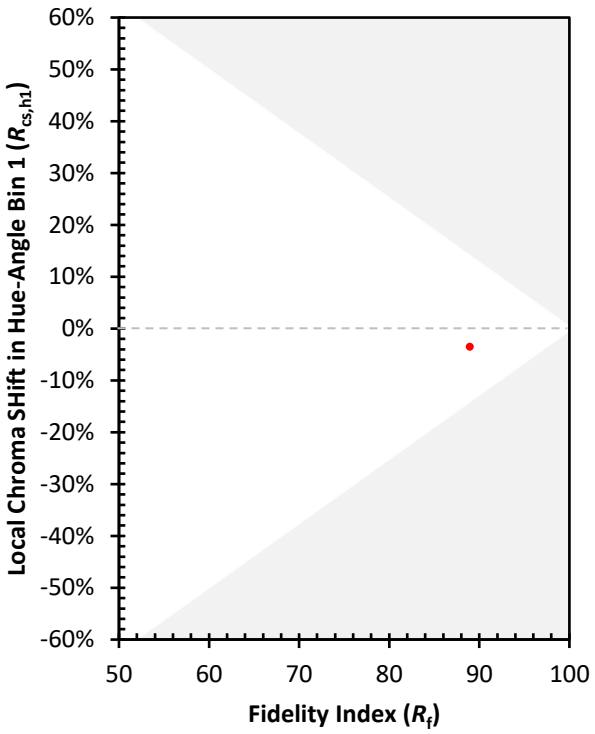
Measure Comparisons





(END OF REPORT)