

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: METALUX

Report Number: P828078

Luminaire Tested: **OHBL-30SE-MCL-UNV-L935-CD-UPL30**

Issue Date: 5/3/2024



Test Information

Test Method: LM-79-08
Report Number: P828078
REPORT IS A COMBINATION OF REPORTS P826282 AND G3-2310-221-4
Test Lab: INNOVATION CENTER
Issue Date: 5/3/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: OHBL-30SE-MCL-UNV-L935-CD-UPL30
Description:
Light Source: -
Ballast/Driver: -

Summary

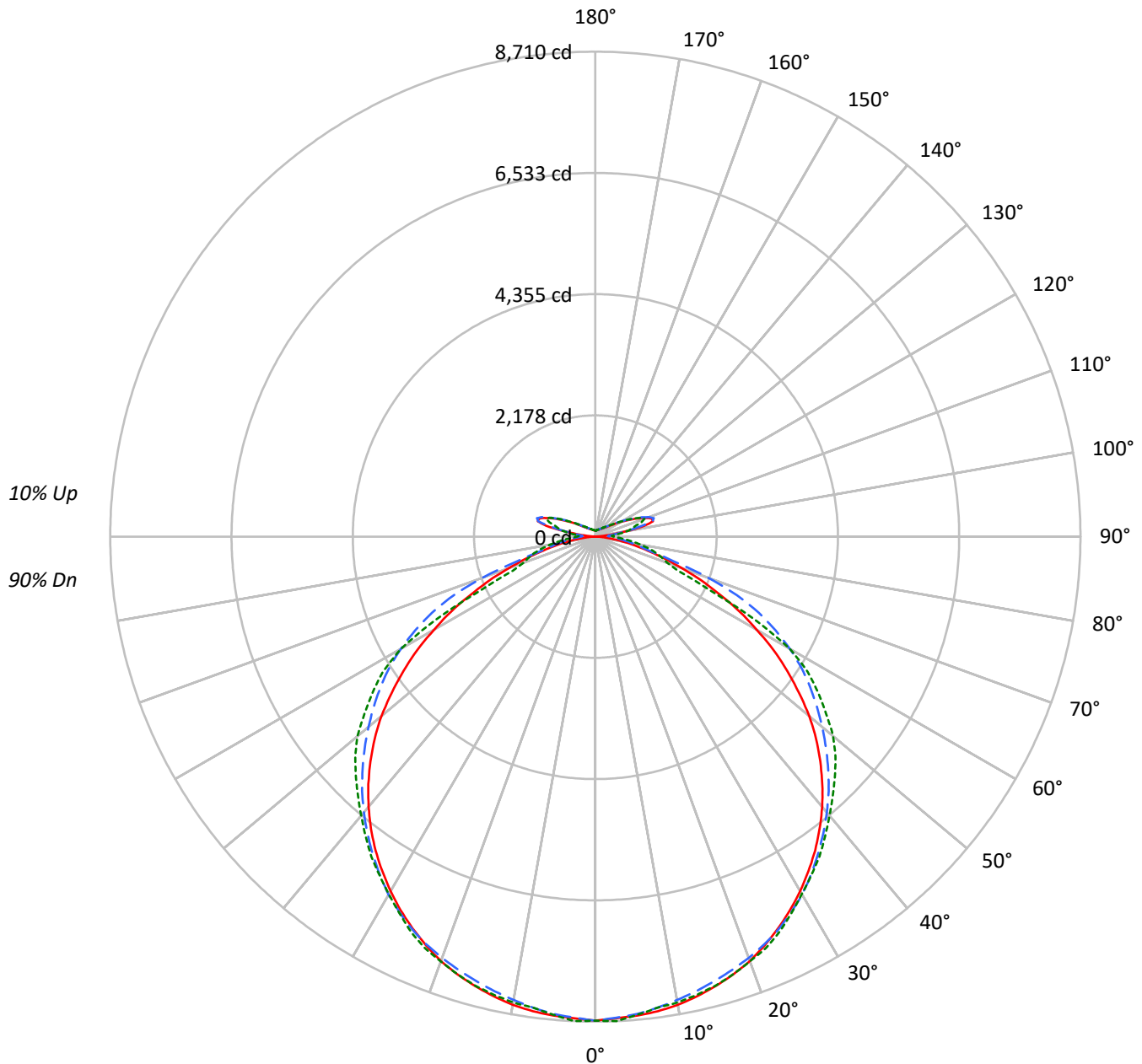
Lumens per Lamp: N/A
Luminaire Lumens: 27121.7 lumens
Efficiency: N/A
Efficacy: 137.5 lumens/watt
Spacing Criteria (0/90/45): 1.26 / 1.27 / 1.39
Luminous Opening: Rectangular w/ Sides (W: 3.78' x L: 1.67' x H: 0.17')
CIE Type: Semi-Direct

Input Watts (W): 197.2
Input Voltage (V): NR
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

TEST NUMBER: P828078

CATALOG NUMBER: OHBL-30SE-MCL-UNV-L935-CD-UPL30

Luminous Intensity Polar Plot





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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20				20				20
RC	80				70				50				30				10
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
RCR																	
0	117	117	117	117	113	113	113	113	105	105	105	99	99	99	92	92	92
1	107	102	98	94	103	99	95	92	93	90	87	87	85	83	82	80	78
2	97	89	83	77	94	87	81	76	81	76	72	77	73	69	72	69	66
3	89	79	71	64	85	76	69	63	72	66	61	68	63	58	64	60	56
4	81	70	61	55	78	68	60	54	64	57	52	60	55	50	57	52	48
5	75	62	53	47	72	60	52	46	57	50	45	54	48	43	51	46	42
6	69	56	47	41	66	54	46	40	52	44	39	49	43	38	46	41	37
7	64	51	42	36	61	49	41	36	47	40	35	45	38	34	42	37	33
8	59	46	38	32	57	45	37	32	43	36	31	41	35	30	39	33	29
9	55	42	34	29	53	41	34	28	39	32	28	38	31	27	36	30	26
10	52	39	31	26	50	38	31	26	36	30	25	35	29	24	33	28	24

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	14847	14847	14847
5°	14678	14624	14724
10°	14553	14396	14622
15°	14389	14224	14587
20°	14224	14113	14523
25°	13977	14001	14462
30°	13712	13829	14260
35°	13407	13559	14186
40°	13030	13280	14063
45°	12538	12958	14068
50°	11900	12591	14069
55°	10948	12229	13676
60°	9738	11704	12796
65°	8206	10739	8238
70°	6450	8366	6102
75°	4663	4952	6396
80°	3053	4097	6448
85°	1529	3721	6780



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	819.6	3.0
10°-20°	2350.3	8.7
20°-30°	3589.7	13.2
30°-40°	4355.5	16.1
40°-50°	4565.0	16.8
50°-60°	4136.6	15.3
60°-70°	2773.4	10.2
70°-80°	1245.4	4.6
80°-90°	457.4	1.7
90°-100°	333.3	1.2
100°-110°	956.0	3.5
110°-120°	766.4	2.8
120°-130°	364.3	1.3
130°-140°	186.9	0.7
140°-150°	110.3	0.4
150°-160°	66.0	0.2
160°-170°	35.0	0.1
170°-180°	10.7	0.0
0°-30°	6759.6	24.9
0°-40°	11115.1	41.0
0°-60°	19816.7	73.1
0°-90°	24292.8	89.6
90°-120°	2055.8	7.6
90°-150°	2717.2	10.0
90°-180°	2829.0	10.4
0°-180°	27121.7	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	8693	8693	8693	8693	8693	
5°	8636	8666	8606	8632	8621	821
15°	8356	8323	8264	8337	8347	2359
25°	7762	7729	7783	7854	7832	3578
35°	6880	6896	6967	7041	7013	4300
45°	5710	5803	5911	6062	6081	4399
55°	4202	4404	4704	4893	4882	3751
65°	2466	2852	3238	2732	2231	2457
75°	970	1408	1036	1060	1129	1060
85°	167	320	411	496	520	204
90°	7	141	257	317	330	14
95°	49	162	262	325	341	173
105°	1069	1101	1062	830	745	1011
115°	745	750	771	784	772	746
125°	370	383	405	399	395	347
135°	224	229	236	246	247	177
145°	166	170	174	177	178	106
155°	137	140	142	144	143	64
165°	120	121	122	124	124	34
175°	110	111	110	110	110	11
180°	108	108	108	108	108	



TEST NUMBER: P828078

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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	8692.6	8692.6	8692.6	8692.6	8692.6
2.5°	8657.4	8693.8	8648.6	8697.6	8710.2
5°	8636.0	8666.2	8605.8	8632.3	8620.9
7.5°	8597.1	8607.1	8535.5	8556.8	8534.2
10°	8539.2	8534.2	8450.0	8491.5	8496.5
12.5°	8453.8	8438.7	8363.2	8426.2	8427.4
15°	8355.8	8323.1	8264.0	8336.9	8346.9
17.5°	8242.7	8199.9	8160.9	8255.2	8240.1
20°	8110.7	8060.4	8052.8	8155.9	8118.2
22.5°	7947.3	7908.3	7925.9	8023.9	8000.1
25°	7762.5	7728.6	7782.6	7854.3	7831.7
27.5°	7567.7	7547.6	7609.2	7664.5	7620.5
30°	7354.0	7342.7	7424.4	7469.7	7414.3
32.5°	7121.5	7125.2	7203.2	7264.8	7213.2
35°	6880.2	6896.5	6966.9	7041.1	7013.4
37.5°	6615.0	6651.4	6721.8	6806.0	6777.1
40°	6334.7	6387.5	6465.4	6567.2	6540.8
42.5°	6031.8	6098.4	6198.9	6312.1	6309.6
45°	5710.0	5803.0	5911.1	6061.9	6080.8
47.5°	5375.7	5480.0	5617.0	5818.1	5847.0
50°	5012.4	5143.2	5314.1	5555.4	5573.0
52.5°	4607.8	4786.2	5012.4	5243.8	5222.3
55°	4201.8	4404.1	4704.5	4893.0	4881.8
57.5°	3797.0	4024.5	4389.0	4523.5	4522.2
60°	3344.6	3632.4	4030.8	4132.7	4032.1
62.5°	2926.0	3235.3	3648.8	3574.6	3230.2
65°	2466.0	2851.8	3237.8	2732.5	2231.0
67.5°	2057.5	2459.8	2750.1	1871.5	1602.5
70°	1646.5	2090.2	2144.2	1388.8	1370.0
72.5°	1282.0	1754.6	1479.3	1189.0	1249.3
75°	970.3	1407.7	1035.7	1059.6	1128.7
77.5°	707.6	1080.9	805.7	928.8	985.4
80°	486.4	765.4	657.3	780.5	819.5
82.5°	305.4	505.2	526.7	628.4	668.7
85°	167.2	320.5	411.0	496.5	520.3
87.5°	69.2	193.6	314.3	383.3	403.5
90°	7.1	141.0	257.4	317.3	329.8
92.5°	18.8	124.2	228.4	282.4	292.9
95°	48.8	162.4	262.5	324.8	340.6
97.5°	292.5	341.1	371.9	437.9	475.4
100°	576.2	649.0	552.7	581.5	589.4
102.5°	908.3	955.2	803.8	698.1	676.8
105°	1069.2	1101.4	1061.7	830.1	744.7



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	862.2	877.6	903.6	904.1	886.6
115°	745.1	750.1	770.6	784.0	771.5
117.5°	630.1	636.8	657.3	658.2	654.0
120°	531.8	540.5	555.2	556.4	551.0
122.5°	445.9	458.4	476.4	473.5	467.3
125°	370.5	382.6	405.1	398.9	395.2
127.5°	316.8	324.3	341.8	344.8	341.8
130°	274.3	282.2	296.8	303.4	302.6
132.5°	246.3	253.4	263.0	270.5	269.7
135°	223.8	229.3	235.5	245.9	247.2
137.5°	205.1	210.9	215.1	224.7	225.9
140°	190.9	195.1	198.0	204.7	206.8
142.5°	177.2	181.8	184.7	190.1	192.2
145°	166.3	170.1	174.2	177.2	178.4
147.5°	157.6	160.9	164.2	165.9	167.2
150°	150.1	152.6	155.9	156.8	157.6
152.5°	143.4	145.1	147.6	149.2	149.2
155°	136.8	140.5	142.2	143.8	142.6
157.5°	131.8	134.7	136.3	137.2	138.0
160°	127.6	129.7	131.3	132.2	133.0
162.5°	123.8	125.5	126.3	127.2	128.0
165°	120.5	121.3	122.2	123.8	123.8
167.5°	117.2	119.2	118.8	119.7	119.7
170°	114.7	115.5	116.3	115.1	115.1
172.5°	112.2	113.0	113.8	112.6	112.6
175°	110.5	111.3	110.1	109.7	109.7
177.5°	110.9	110.5	109.2	108.0	107.6
180°	108.4	108.4	108.4	108.4	108.4



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180° - - 45°-225° - - - 90°-270°







107.5°	1069.6	1102.2	1100.8	984.2	870.0
110°	982.5	1012.6	1023.2	992.0	936.2



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-7

Test Date: 07/28/2023

Luminaire Tested: OHB-15SE-N-UNV-L935-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L935-CD.

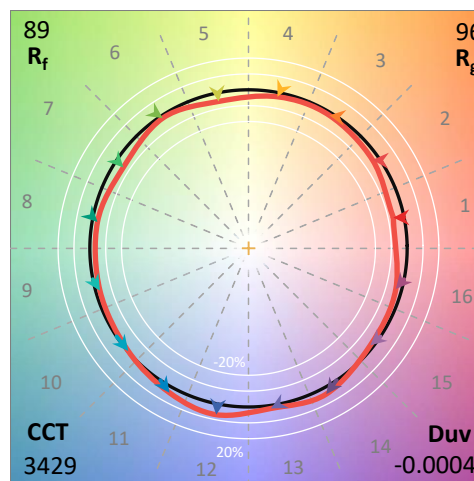
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2307-100-7
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/04/2023
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: METALUX
 Catalog Number: **OHB-15SE-N-UNV-L935-CD**
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 90CRI, 3500K LEDS AND NARROW LENS

LENS

Spectral Parameters

CCT (K):	3429	CRI (Ra):	90.9		
CIE u':	0.2376	R1:	91.1	R9:	50.7
CIE v':	0.5121	R2:	96.7	R10:	90.8
Duv:	-0.0004	R3:	97.7	R11:	88.9
CIE x:	0.4088	R4:	88.8	R12:	74.6
CIE y:	0.3916	R5:	90.3	R13:	92.9
CIE z:	0.1997	R6:	94.5	R14:	99.5
Peak Wavelength (nm):	609	R7:	89.8		
Dominant Wavelength (nm):	581	R8:	78.2		
Purity:	40.4				
Rf:	88.9				
Rg:	96.3				



Test Conditions

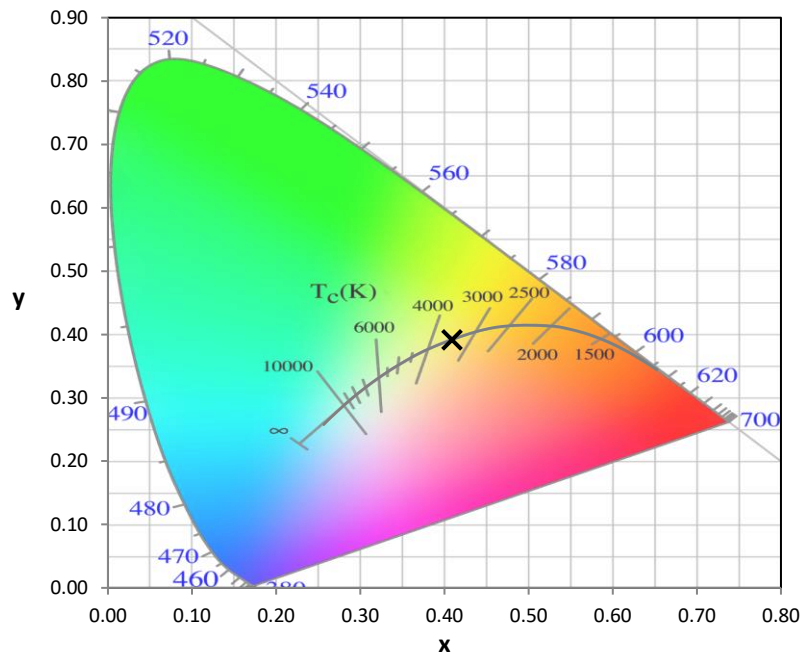
Stabilization Time: 23M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.7/55%
 Sphere Temperature (°C): 25.2

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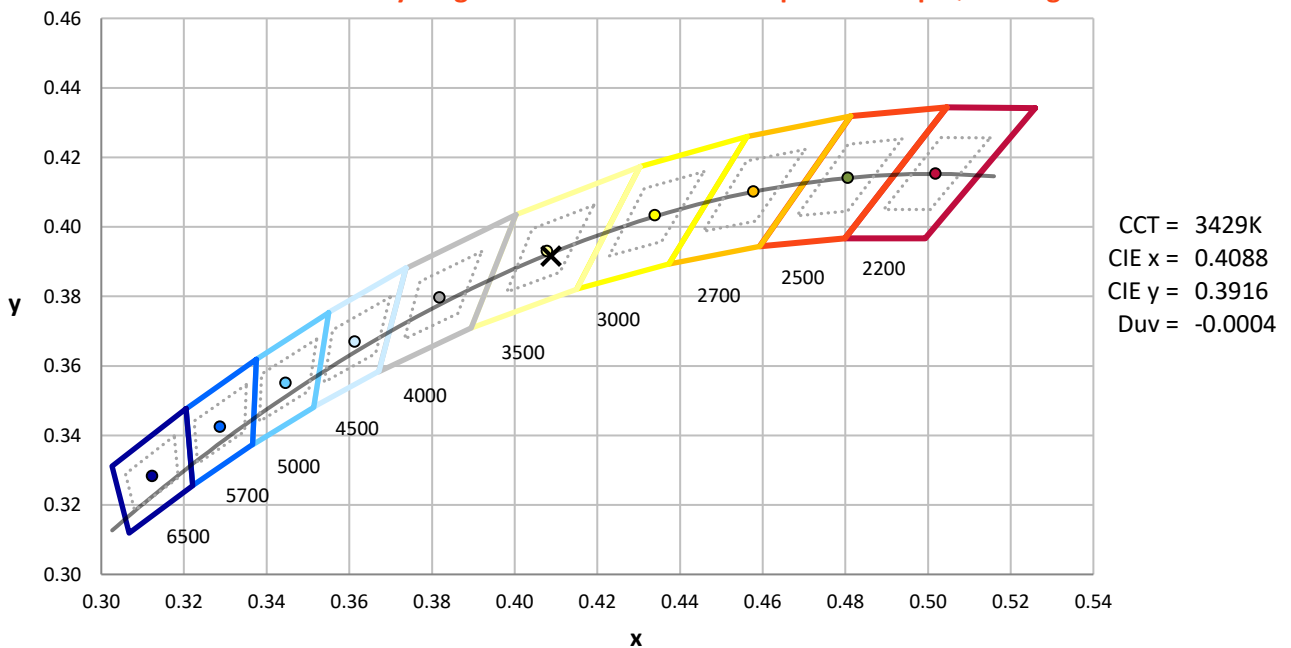
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	2/9/2023	8/9/2023
Power Meter	XITRON 2801 IN0071	11/29/2022	11/29/2023
AC Power Source	CHROMA 61603 IN0063	11/28/2022	11/28/2023
DC Power Source	AGILENT E3634A IN0208	11/28/2022	11/28/2023
Sphere Thermometer	ONSET IN0085	11/28/2022	11/28/2023
Room Thermometer	ONSET IN0046	11/28/2022	11/28/2023

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CIE 1931 Chromaticity Diagram



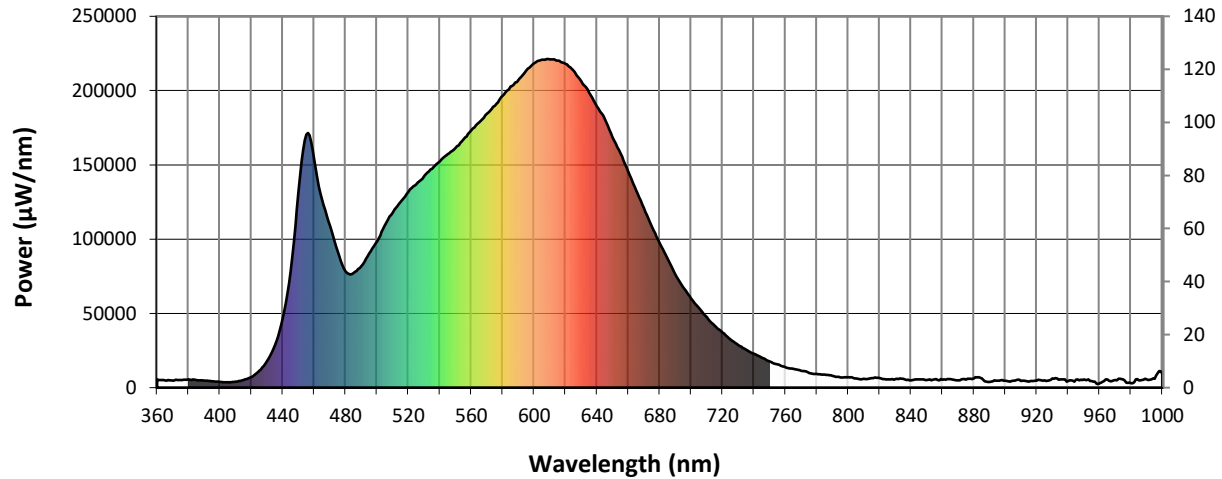
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3500K 4-step quadrangle

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Photopic Flux vs. Wavelength

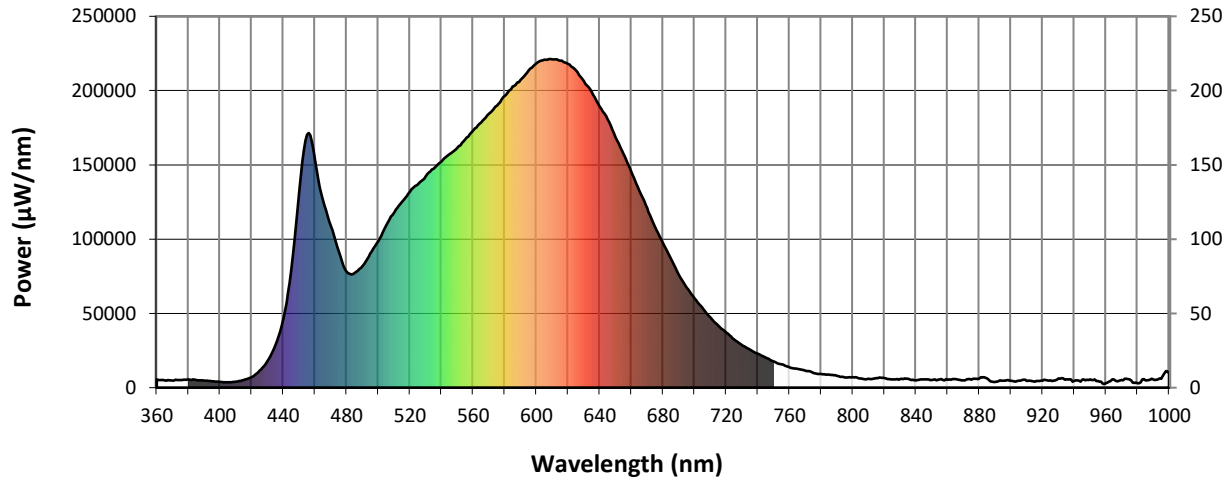


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λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	5498	NR	490	81900	NR	620	217907	NR	750	17550	NR	880	6189	NR
365	4903	NR	495	90120	NR	625	213734	NR	755	15662	NR	885	6187	NR
370	4767	NR	500	98453	NR	630	206250	NR	760	13792	NR	890	3830	NR
375	5225	NR	505	109244	NR	635	198796	NR	765	12765	NR	895	4688	NR
380	5499	NR	510	117784	NR	640	189406	NR	770	11372	NR	900	4680	NR
385	5081	NR	515	125000	NR	645	180677	NR	775	9965	NR	905	4599	NR
390	4739	NR	520	131786	NR	650	168402	NR	780	9154	NR	910	4495	NR
395	4255	NR	525	136796	NR	655	157693	NR	785	8847	NR	915	3983	NR
400	3864	NR	530	142357	NR	660	145357	NR	790	7937	NR	920	4675	NR
405	3583	NR	535	147243	NR	665	132743	NR	795	6956	NR	925	4952	NR
410	3994	NR	540	152273	NR	670	120757	NR	800	6970	NR	930	6097	NR
415	5055	NR	545	157222	NR	675	108421	NR	805	6299	NR	935	5657	NR
420	7131	NR	550	161271	NR	680	97325	NR	810	6023	NR	940	4574	NR
425	11311	NR	555	167038	NR	685	86839	NR	815	6343	NR	945	5252	NR
430	17754	NR	560	173115	NR	690	76248	NR	820	6462	NR	950	5635	NR
435	28634	NR	565	178502	NR	695	67406	NR	825	5476	NR	955	4501	NR
440	46392	NR	570	184331	NR	700	60039	NR	830	5786	NR	960	2938	NR
445	78344	NR	575	189666	NR	705	53650	NR	835	5884	NR	965	5544	NR
450	131219	NR	580	196488	NR	710	47273	NR	840	4862	NR	970	5050	NR
455	170311	NR	585	202769	NR	715	41664	NR	845	5651	NR	975	5575	NR
460	154269	NR	590	207213	NR	720	37083	NR	850	5178	NR	980	2973	NR
465	126622	NR	595	213472	NR	725	32494	NR	855	5510	NR	985	4912	NR
470	109065	NR	600	218473	NR	730	28665	NR	860	5438	NR	990	5454	NR
475	91762	NR	605	220737	NR	735	25540	NR	865	5848	NR	995	6068	NR
480	78213	NR	610	221090	NR	740	22878	NR	870	4969	NR	1000	9406	NR
485	77035	NR	615	220059	NR	745	20304	NR	875	5438	NR			

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Scotopic Flux vs. Wavelength



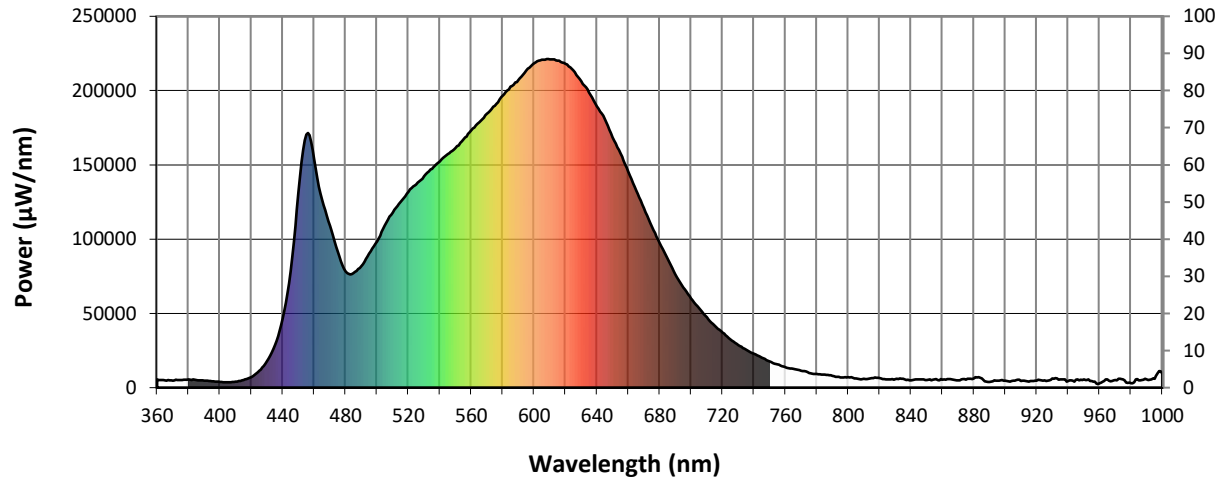
Scotopic Lumens: 19629.6

S/P: 1.6

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	5498	NR	490	81900	NR	620	217907	NR	750	17550	NR	880	6189	NR
365	4903	NR	495	90120	NR	625	213734	NR	755	15662	NR	885	6187	NR
370	4767	NR	500	98453	NR	630	206250	NR	760	13792	NR	890	3830	NR
375	5225	NR	505	109244	NR	635	198796	NR	765	12765	NR	895	4688	NR
380	5499	NR	510	117784	NR	640	189406	NR	770	11372	NR	900	4680	NR
385	5081	NR	515	125000	NR	645	180677	NR	775	9965	NR	905	4599	NR
390	4739	NR	520	131786	NR	650	168402	NR	780	9154	NR	910	4495	NR
395	4255	NR	525	136796	NR	655	157693	NR	785	8847	NR	915	3983	NR
400	3864	NR	530	142357	NR	660	145357	NR	790	7937	NR	920	4675	NR
405	3583	NR	535	147243	NR	665	132743	NR	795	6956	NR	925	4952	NR
410	3994	NR	540	152273	NR	670	120757	NR	800	6970	NR	930	6097	NR
415	5055	NR	545	157222	NR	675	108421	NR	805	6299	NR	935	5657	NR
420	7131	NR	550	161271	NR	680	97325	NR	810	6023	NR	940	4574	NR
425	11311	NR	555	167038	NR	685	86839	NR	815	6343	NR	945	5252	NR
430	17754	NR	560	173115	NR	690	76248	NR	820	6462	NR	950	5635	NR
435	28634	NR	565	178502	NR	695	67406	NR	825	5476	NR	955	4501	NR
440	46392	NR	570	184331	NR	700	60039	NR	830	5786	NR	960	2938	NR
445	78344	NR	575	189666	NR	705	53650	NR	835	5884	NR	965	5544	NR
450	131219	NR	580	196488	NR	710	47273	NR	840	4862	NR	970	5050	NR
455	170311	NR	585	202769	NR	715	41664	NR	845	5651	NR	975	5575	NR
460	154269	NR	590	207213	NR	720	37083	NR	850	5178	NR	980	2973	NR
465	126622	NR	595	213472	NR	725	32494	NR	855	5510	NR	985	4912	NR
470	109065	NR	600	218473	NR	730	28665	NR	860	5438	NR	990	5454	NR
475	91762	NR	605	220737	NR	735	25540	NR	865	5848	NR	995	6068	NR
480	78213	NR	610	221090	NR	740	22878	NR	870	4969	NR	1000	9406	NR
485	77035	NR	615	220059	NR	745	20304	NR	875	5438	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 7912.5

M/P: 0.65

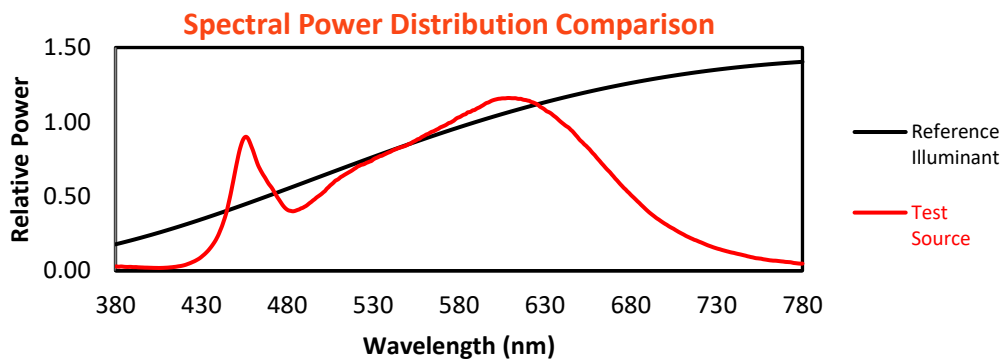
λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	5498	NR	490	81900	NR	620	217907	NR	750	17550	NR	880	6189	NR
365	4903	NR	495	90120	NR	625	213734	NR	755	15662	NR	885	6187	NR
370	4767	NR	500	98453	NR	630	206250	NR	760	13792	NR	890	3830	NR
375	5225	NR	505	109244	NR	635	198796	NR	765	12765	NR	895	4688	NR
380	5499	NR	510	117784	NR	640	189406	NR	770	11372	NR	900	4680	NR
385	5081	NR	515	125000	NR	645	180677	NR	775	9965	NR	905	4599	NR
390	4739	NR	520	131786	NR	650	168402	NR	780	9154	NR	910	4495	NR
395	4255	NR	525	136796	NR	655	157693	NR	785	8847	NR	915	3983	NR
400	3864	NR	530	142357	NR	660	145357	NR	790	7937	NR	920	4675	NR
405	3583	NR	535	147243	NR	665	132743	NR	795	6956	NR	925	4952	NR
410	3994	NR	540	152273	NR	670	120757	NR	800	6970	NR	930	6097	NR
415	5055	NR	545	157222	NR	675	108421	NR	805	6299	NR	935	5657	NR
420	7131	NR	550	161271	NR	680	97325	NR	810	6023	NR	940	4574	NR
425	11311	NR	555	167038	NR	685	86839	NR	815	6343	NR	945	5252	NR
430	17754	NR	560	173115	NR	690	76248	NR	820	6462	NR	950	5635	NR
435	28634	NR	565	178502	NR	695	67406	NR	825	5476	NR	955	4501	NR
440	46392	NR	570	184331	NR	700	60039	NR	830	5786	NR	960	2938	NR
445	78344	NR	575	189666	NR	705	53650	NR	835	5884	NR	965	5544	NR
450	131219	NR	580	196488	NR	710	47273	NR	840	4862	NR	970	5050	NR
455	170311	NR	585	202769	NR	715	41664	NR	845	5651	NR	975	5575	NR
460	154269	NR	590	207213	NR	720	37083	NR	850	5178	NR	980	2973	NR
465	126622	NR	595	213472	NR	725	32494	NR	855	5510	NR	985	4912	NR
470	109065	NR	600	218473	NR	730	28665	NR	860	5438	NR	990	5454	NR
475	91762	NR	605	220737	NR	735	25540	NR	865	5848	NR	995	6068	NR
480	78213	NR	610	221090	NR	740	22878	NR	870	4969	NR	1000	9406	NR
485	77035	NR	615	220059	NR	745	20304	NR	875	5438	NR			

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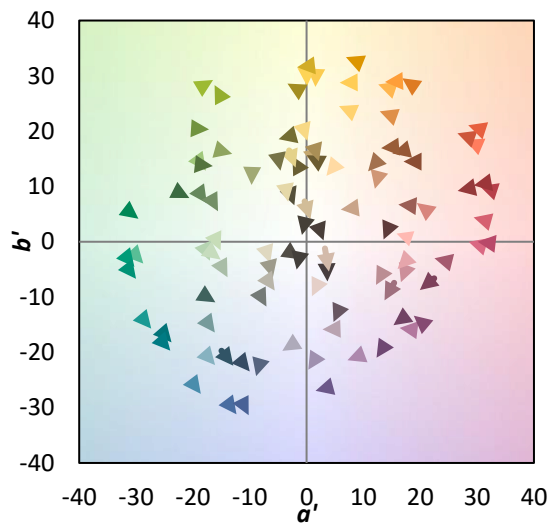
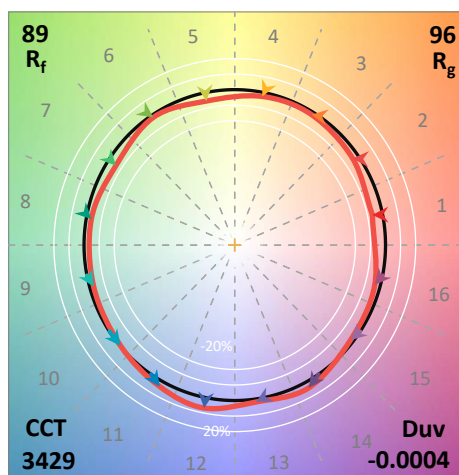
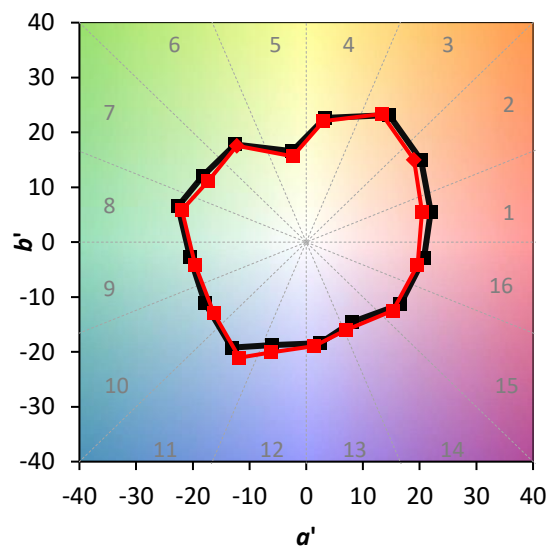
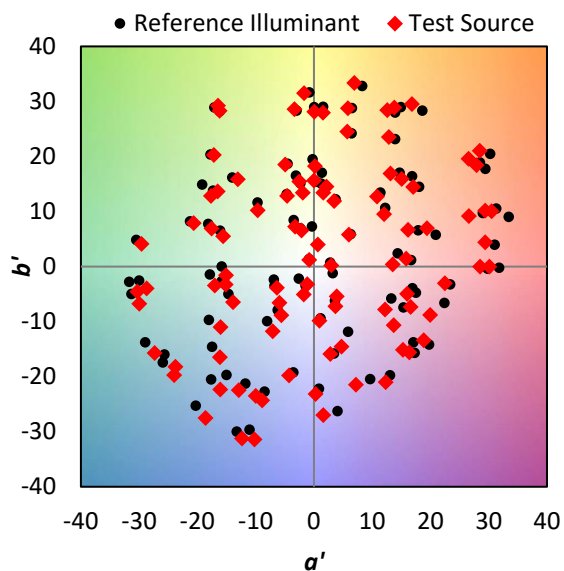
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Summary

$R_f = 88.9$
 $R_g = 96.3$
 $CIE R_a = 90.9$
 $R_g = 50.7$



Color Vector Graphics

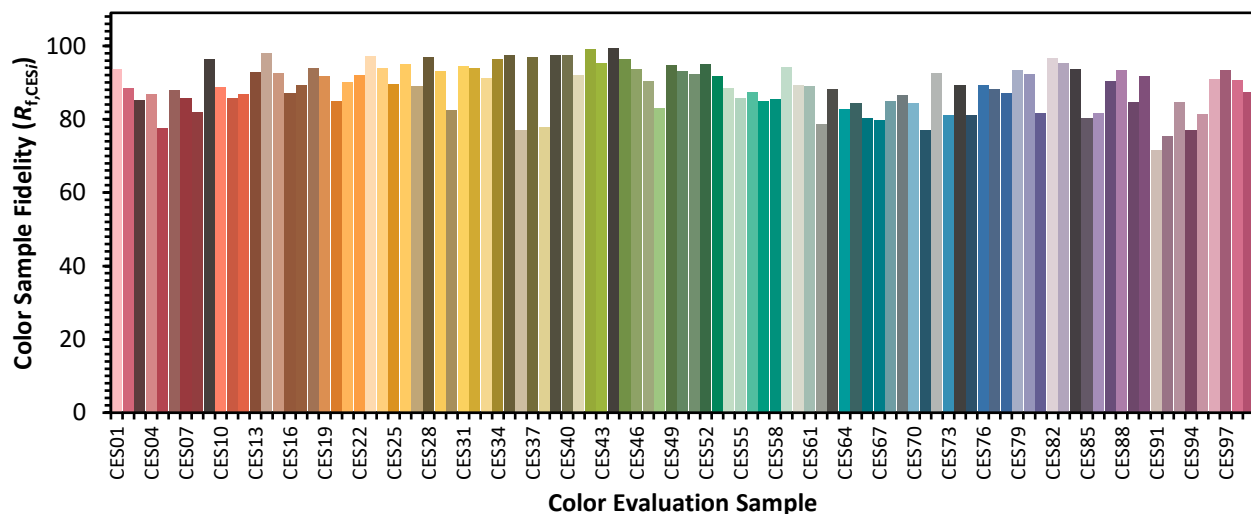


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Individual Sample Fidelity Index ($R_{f,i}$)

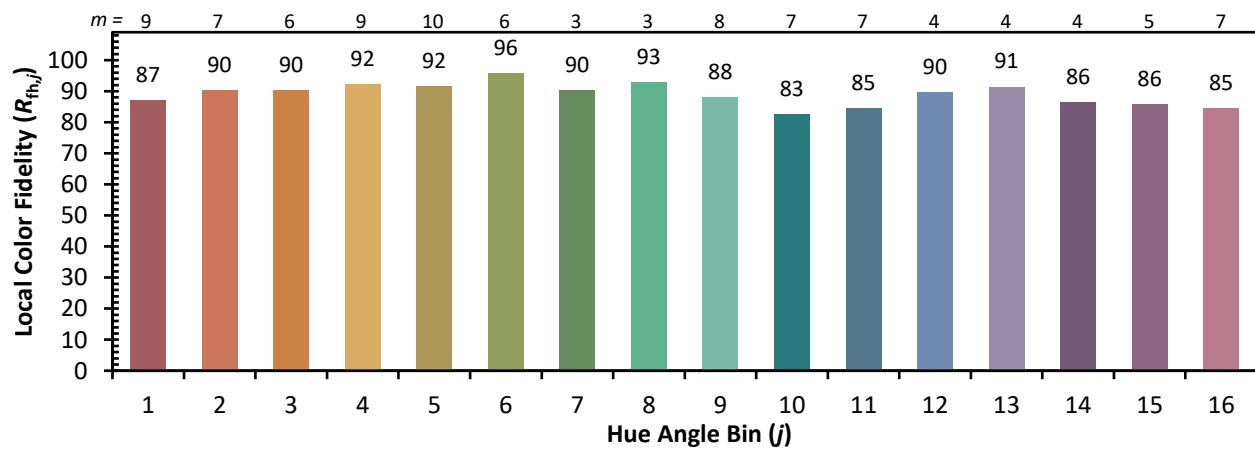
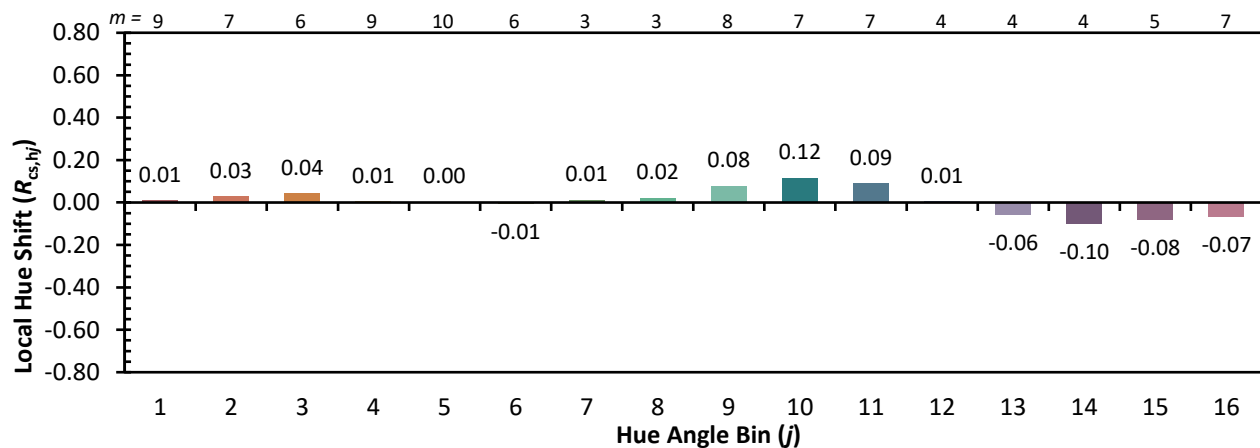
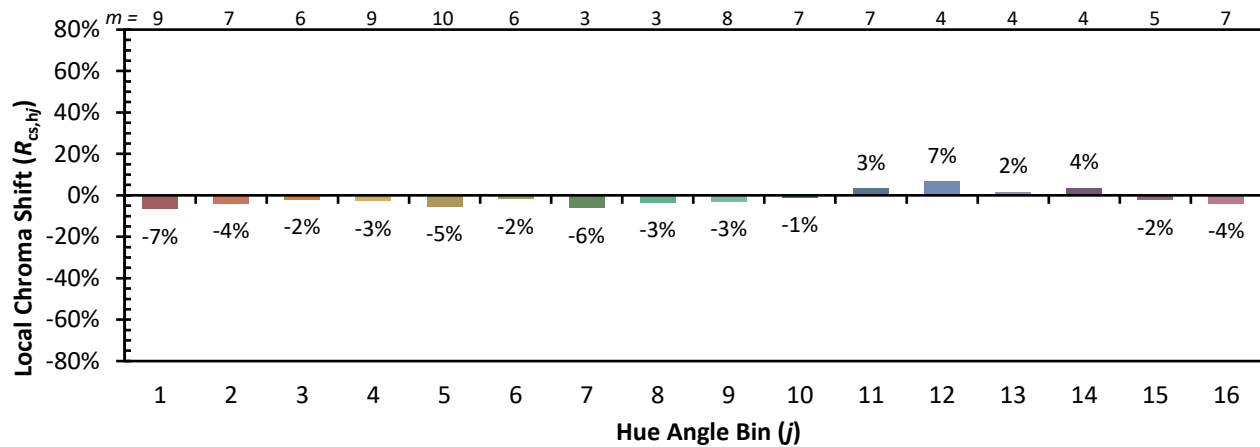
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CES02 = 62	CES27 = 89	CES52 = 95	CES77 = 88
CES03 = 31	CES28 = 97	CES53 = 92	CES78 = 87
CES04 = 70	CES29 = 93	CES54 = 89	CES79 = 93
CES05 = 49	CES30 = 82	CES55 = 86	CES80 = 92
CES06 = 51	CES31 = 95	CES56 = 87	CES81 = 82
CES07 = 42	CES32 = 94	CES57 = 85	CES82 = 97
CES08 = 41	CES33 = 91	CES58 = 85	CES83 = 95
CES09 = 29	CES34 = 96	CES59 = 94	CES84 = 94
CES10 = 75	CES35 = 97	CES60 = 89	CES85 = 80
CES11 = 58	CES36 = 77	CES61 = 89	CES86 = 82
CES12 = 64	CES37 = 97	CES62 = 79	CES87 = 90
CES13 = 43	CES38 = 78	CES63 = 88	CES88 = 93
CES14 = 74	CES39 = 97	CES64 = 83	CES89 = 85
CES15 = 71	CES40 = 98	CES65 = 84	CES90 = 92
CES16 = 47	CES41 = 92	CES66 = 80	CES91 = 72
CES17 = 50	CES42 = 99	CES67 = 80	CES92 = 75
CES18 = 56	CES43 = 95	CES68 = 85	CES93 = 85
CES19 = 71	CES44 = 99	CES69 = 86	CES94 = 77
CES20 = 66	CES45 = 96	CES70 = 84	CES95 = 81
CES21 = 86	CES46 = 94	CES71 = 77	CES96 = 91
CES22 = 78	CES47 = 91	CES72 = 93	CES97 = 93
CES23 = 91	CES48 = 83	CES73 = 81	CES98 = 91
CES24 = 90	CES49 = 95	CES74 = 89	CES99 = 87
CES25 = 71	CES50 = 93	CES75 = 81	



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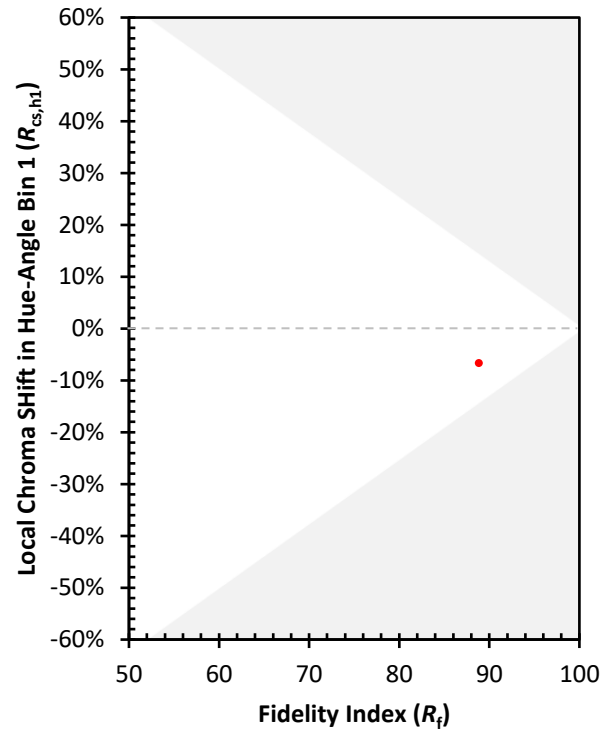
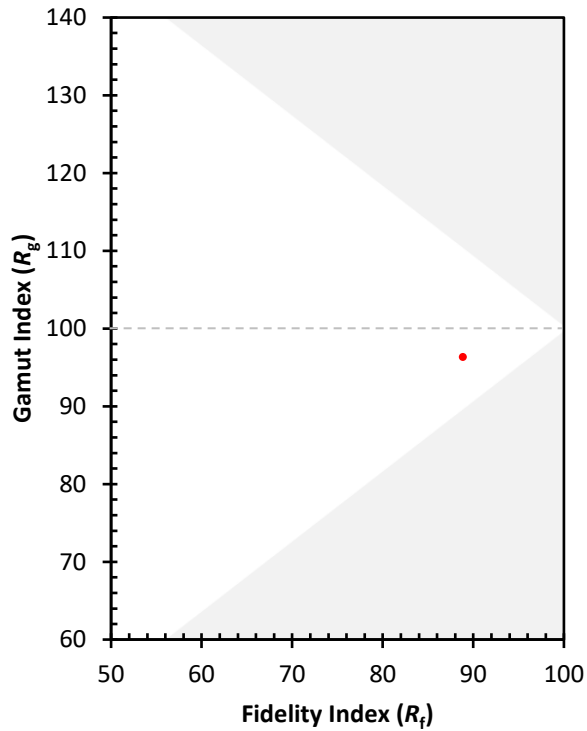
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)