

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: P828046

Luminaire Tested: **OHBL-24SE-A-UNV-L935-CD-UPL24**

Issue Date: 5/3/2024



Test Information

Test Method: LM-79-08
Report Number: P828046
REPORT IS A COMBINATION OF REPORTS P826245 AND G3-2310-221-6
Test Lab: INNOVATION CENTER
Issue Date: 5/3/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: OHBL-24SE-A-UNV-L935-CD-UPL24
Description:
Light Source: -
Ballast/Driver: -

Summary

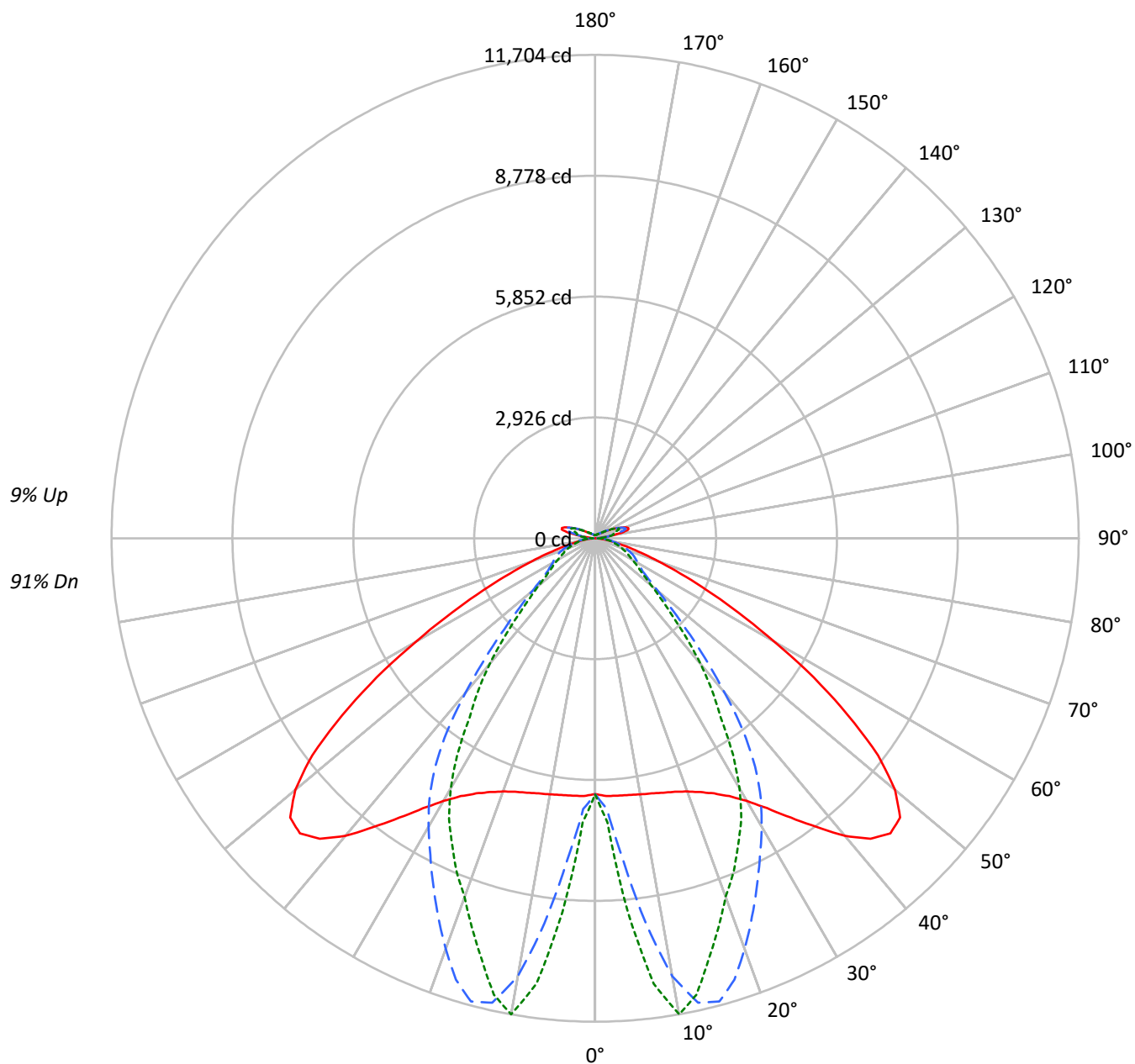
Lumens per Lamp: N/A
Luminaire Lumens: 21891.9 lumens
Efficiency: N/A
Efficacy: 140.9 lumens/watt
Spacing Criteria (0/90/45): 2.18 / 1.37 / 1.3
Luminous Opening: Rectangular w/ Sides (W: 3.78' x L: 1.67' x H: 0.17')
CIE Type: Direct

Input Watts (W): 155.4
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

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CATALOG NUMBER: OHBL-24SE-A-UNV-L935-CD-UPL24

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		106	106	106		100	100	100		94	94	94
1	108	104	101	98	105	101	98	95		95	93	91		90	88	86		85	84	82
2	100	93	87	83	97	91	85	81		86	81	78		81	78	75		77	74	72
3	93	84	77	71	90	81	75	70		77	72	68		73	69	65		70	66	63
4	86	75	68	62	83	73	66	61		70	64	59		67	62	58		64	59	56
5	80	68	60	55	77	67	59	54		64	57	53		61	55	51		58	54	50
6	74	62	54	49	72	61	53	48		58	52	47		56	50	46		53	49	45
7	69	57	49	44	67	56	48	43		53	47	42		51	46	41		49	44	40
8	65	52	45	39	63	51	44	39		49	43	38		47	42	38		46	41	37
9	60	48	41	36	59	47	40	35		46	39	35		44	38	34		42	37	34
10	57	45	38	33	55	44	37	32		42	36	32		41	35	31		40	34	31

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	10579	10579	10579
5°	10633	13305	15507
10°	10727	18343	20142
15°	10983	19982	18487
20°	11437	18541	16522
25°	12271	16674	15112
30°	13683	15014	13438
35°	16086	13141	10708
40°	19342	10007	8522
45°	22186	6818	6066
50°	22493	4677	4486
55°	19470	3680	3665
60°	14543	3444	3297
65°	9968	3455	3123
70°	6374	3333	3025
75°	3833	3084	2895
80°	2255	2710	2986
85°	1086	2328	2769



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	808.6	3.7
10°-20°	2853.9	13.0
20°-30°	4205.3	19.2
30°-40°	4419.1	20.2
40°-50°	3381.5	15.4
50°-60°	2041.9	9.3
60°-70°	1246.0	5.7
70°-80°	680.1	3.1
80°-90°	243.9	1.1
90°-100°	193.2	0.9
100°-110°	670.8	3.1
110°-120°	575.4	2.6
120°-130°	276.0	1.3
130°-140°	138.1	0.6
140°-150°	80.1	0.4
150°-160°	46.7	0.2
160°-170°	24.2	0.1
170°-180°	7.4	0.0
0°-30°	7867.8	35.9
0°-40°	12286.9	56.1
0°-60°	17710.2	80.9
0°-90°	19880.2	90.8
90°-120°	1439.3	6.6
90°-150°	1933.5	8.8
90°-180°	2012.0	9.2
0°-180°	21891.9	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	6194	6194	6194	6194	6194	
5°	6256	6712	7829	8742	9080	598
15°	6378	9933	11609	10833	10578	1813
25°	6815	11528	9268	8391	8184	3185
35°	8255	9232	6752	5623	5294	5237
45°	10104	5268	3110	2737	2622	7634
55°	7472	1786	1416	1312	1308	6603
65°	2996	1131	1042	891	846	3069
75°	798	703	645	532	511	918
85°	119	218	257	234	212	147
90°	4	28	39	52	58	9
95°	44	92	143	190	215	137
105°	836	827	703	501	460	793
115°	577	582	582	581	576	582
125°	282	297	302	302	299	264
135°	167	170	176	178	179	132
145°	121	124	127	128	128	77
155°	97	98	100	101	101	45
165°	83	84	85	85	85	24
175°	75	76	76	77	77	7
180°	75	75	75	75	75	



TEST NUMBER: P828046

CATALOG NUMBER: OHBL-24SE-A-UNV-L935-CD-UPL24

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	6193.6	6193.6	6193.6	6193.6	6193.6
2.5°	6244.3	6308.1	6559.3	6820.1	6883.6
5°	6255.8	6711.5	7829.3	8742.2	9079.5
7.5°	6269.0	7365.1	9403.0	10520.6	10878.3
10°	6294.3	8191.7	10766.5	11568.9	11704.1
12.5°	6325.6	9067.3	11516.8	11487.6	11317.1
15°	6377.7	9933.4	11609.2	10833.2	10578.5
17.5°	6432.3	10666.2	11206.1	10120.9	9899.1
20°	6521.3	11210.1	10579.0	9487.8	9235.7
22.5°	6649.6	11509.2	9921.4	8915.1	8750.7
25°	6815.1	11528.5	9268.3	8391.1	8183.9
27.5°	7036.8	11261.1	8642.3	7877.7	7658.8
30°	7338.6	10749.0	8060.7	7258.6	6987.2
32.5°	7748.3	10012.0	7461.0	6511.2	6206.8
35°	8255.1	9232.3	6752.2	5623.1	5294.3
37.5°	8808.1	8366.4	5891.9	4836.7	4645.2
40°	9403.0	7474.3	4872.2	4100.8	3963.7
42.5°	9867.3	6504.3	3925.2	3407.8	3262.0
45°	10103.9	5268.0	3110.3	2736.9	2621.9
47.5°	10011.8	4089.3	2465.8	2174.7	2140.2
50°	9473.9	3019.5	1973.8	1791.4	1777.1
52.5°	8633.1	2250.6	1630.5	1517.6	1492.9
55°	7472.2	1786.3	1415.8	1312.2	1308.3
57.5°	6273.5	1517.6	1285.2	1205.0	1177.1
60°	4995.0	1353.2	1186.2	1095.6	1039.0
62.5°	3915.3	1238.2	1113.3	990.4	937.5
65°	2995.6	1130.9	1041.7	891.3	845.9
67.5°	2233.1	1028.7	954.0	787.3	760.7
70°	1627.0	923.8	854.2	700.1	679.1
72.5°	1159.6	819.1	754.2	618.3	595.2
75°	797.6	703.2	645.1	532.3	510.8
77.5°	538.1	585.1	537.6	454.4	445.4
80°	359.3	464.0	434.8	385.1	379.5
82.5°	218.1	336.8	343.2	313.2	298.0
85°	118.8	218.1	257.1	234.3	212.5
87.5°	46.5	120.8	177.2	159.1	149.8
90°	4.2	28.3	39.2	51.7	57.5
92.5°	14.2	37.5	60.0	85.0	95.8
95°	44.2	92.5	143.3	190.0	215.0
97.5°	224.2	242.5	260.8	315.8	343.3
100°	460.0	488.3	394.2	416.7	424.2
102.5°	710.8	706.7	515.0	461.7	455.0
105°	835.8	826.7	703.3	500.8	460.0



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	673.3	683.3	670.0	650.8	624.2
115°	576.7	582.5	582.5	580.8	575.8
117.5°	493.3	494.2	497.5	496.7	497.5
120°	408.3	417.5	425.0	420.8	415.8
122.5°	342.5	352.5	357.5	355.8	350.8
125°	281.7	296.7	302.5	301.7	299.2
127.5°	238.3	249.2	257.5	258.3	257.5
130°	207.5	214.2	222.5	223.3	224.2
132.5°	184.2	190.0	195.8	199.2	198.3
135°	166.7	170.0	175.8	177.5	179.2
137.5°	152.5	155.0	160.0	162.5	162.5
140°	140.0	143.3	147.5	149.2	150.0
142.5°	129.2	132.5	135.8	137.5	137.5
145°	120.8	124.2	126.7	127.5	128.3
147.5°	113.3	116.7	118.3	120.0	120.0
150°	107.5	109.2	111.7	112.5	113.3
152.5°	101.7	103.3	105.8	106.7	106.7
155°	96.7	98.3	100.0	100.8	100.8
157.5°	92.5	94.2	95.8	96.7	96.7
160°	89.2	90.0	91.7	92.5	92.5
162.5°	85.8	86.7	87.5	88.3	88.3
165°	83.3	84.2	85.0	85.0	85.0
167.5°	80.8	80.8	81.7	82.5	82.5
170°	78.3	79.2	79.2	80.0	80.0
172.5°	76.7	77.5	77.5	77.5	78.3
175°	75.0	75.8	75.8	76.7	76.7
177.5°	75.0	75.0	75.0	75.0	75.0
180°	75.0	75.0	75.0	75.0	75.0



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180° - - 45°-225° - - - 90°-270°







107.5°	839.2	842.5	777.5	607.5	505.8
110°	774.2	781.7	744.2	680.0	598.3



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

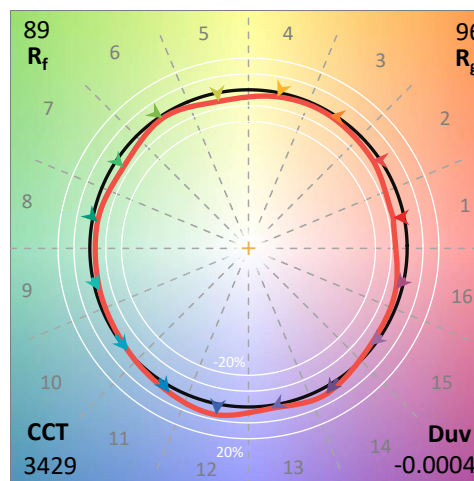
Test Method: LM-79-2019
 Report Number: SP1-2307-100-7
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/04/2023
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: METALUX
 Catalog Number: **OHB-15SE-N-UNV-L935-CD**
 Description: 15000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

LENS

Spectral Parameters

CCT (K): 3429
 CIE u': 0.2376
 CIE v': 0.5121
 Duv: -0.0004
 CIE x: 0.4088
 CIE y: 0.3916
 CIE z: 0.1997
 Peak Wavelength (nm): 609
 Dominant Wavelength (nm): 581
 Purity: 40.4
 Rf: 88.9
 Rg: 96.3

CRI (Ra): 90.9
 R1: 91.1
 R2: 96.7
 R3: 97.7
 R4: 88.8
 R5: 90.3
 R6: 94.5
 R7: 89.8
 R8: 78.2
 R9: 50.7
 R10: 90.8
 R11: 88.9
 R12: 74.6
 R13: 92.9
 R14: 99.5



Test Conditions

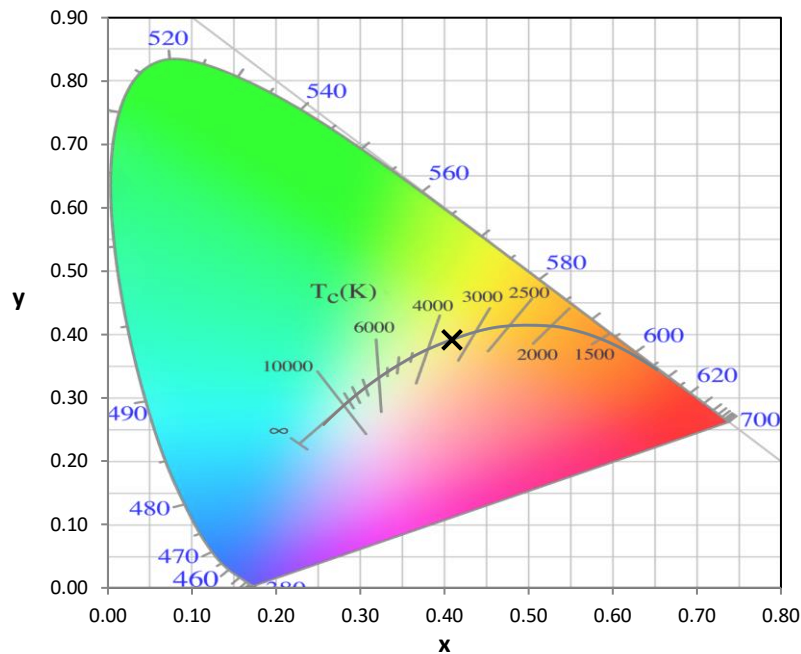
Stabilization Time: 23M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.7/55%
 Sphere Temperature (°C): 25.2

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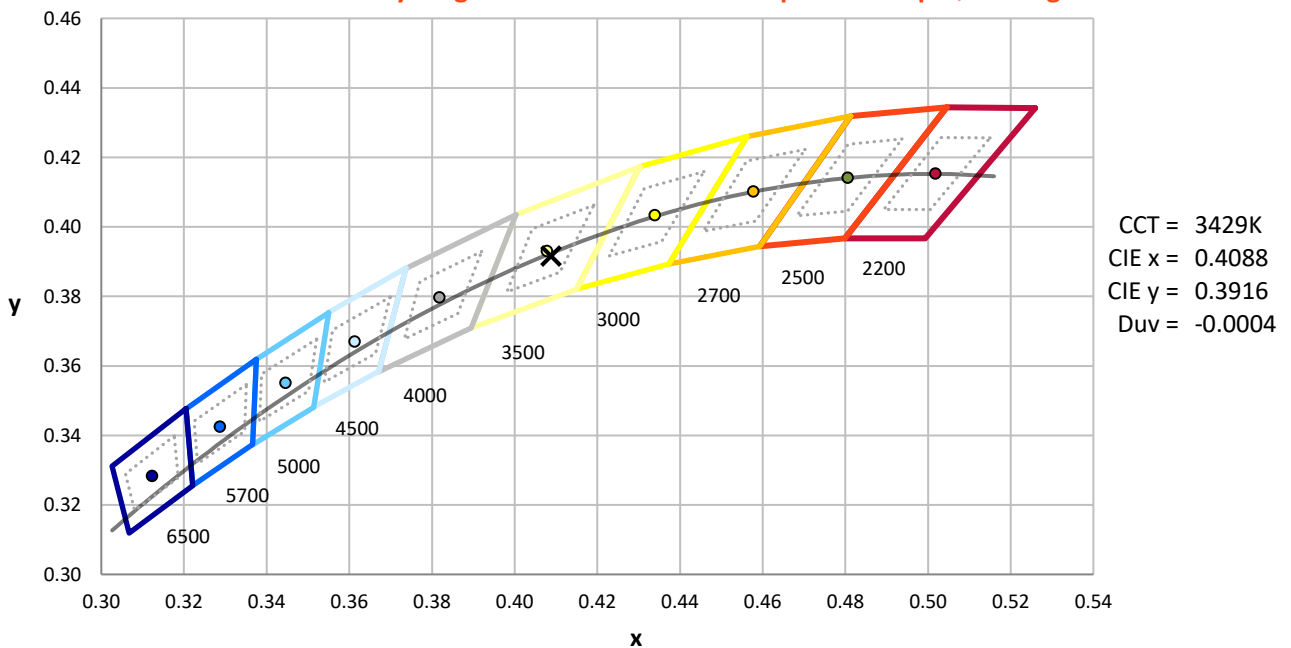
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	2/9/2023	8/9/2023
Power Meter	XITRON 2801 IN0071	11/29/2022	11/29/2023
AC Power Source	CHROMA 61603 IN0063	11/28/2022	11/28/2023
DC Power Source	AGILENT E3634A IN0208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



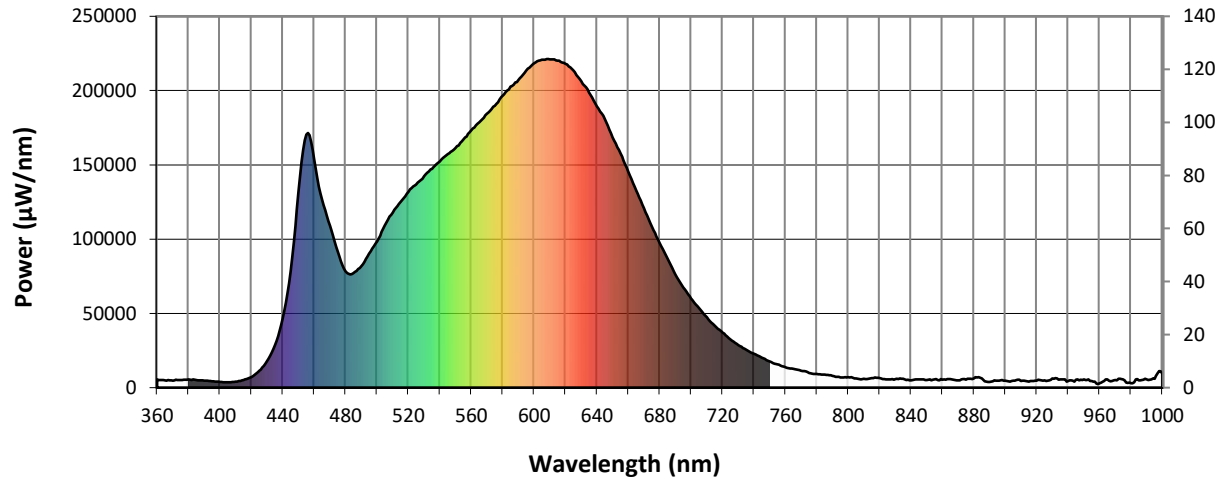
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3500K 4-step quadrangle

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Photopic Flux vs. Wavelength

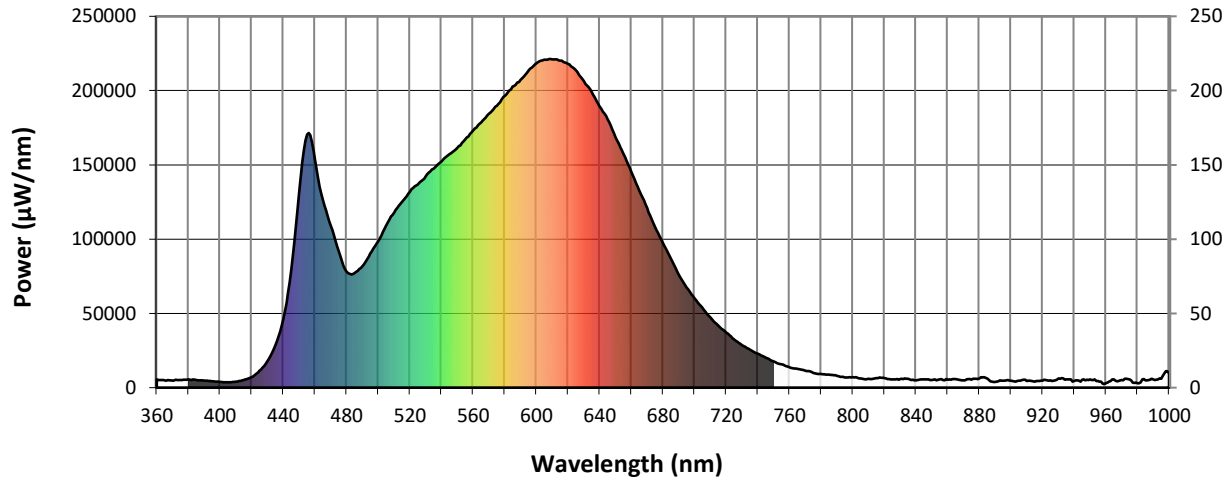


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λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	5498	NR	490	81900	NR	620	217907	NR	750	17550	NR	880	6189	NR
365	4903	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



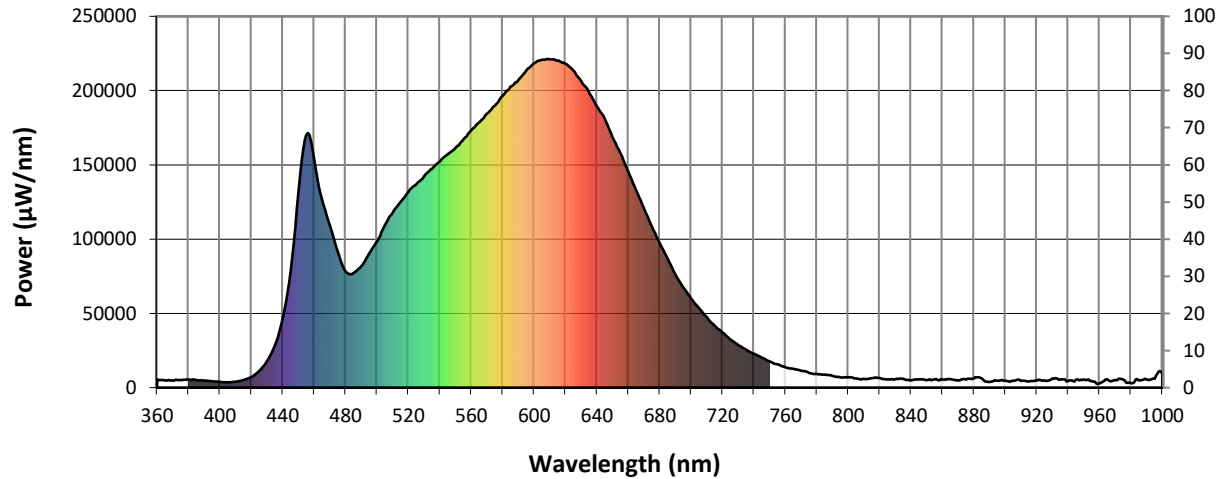
Scotopic Lumens: 19629.6

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

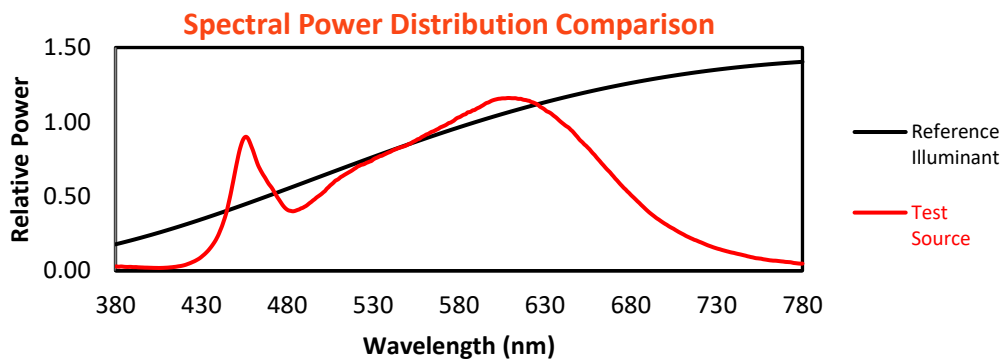
λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	5498	NR	490	81900	NR	620	217907	NR	750	17550	NR	880	6189	NR
365	4903	NR	495	90120	NR	625	213734	NR	755	15662	NR	885	6187	NR
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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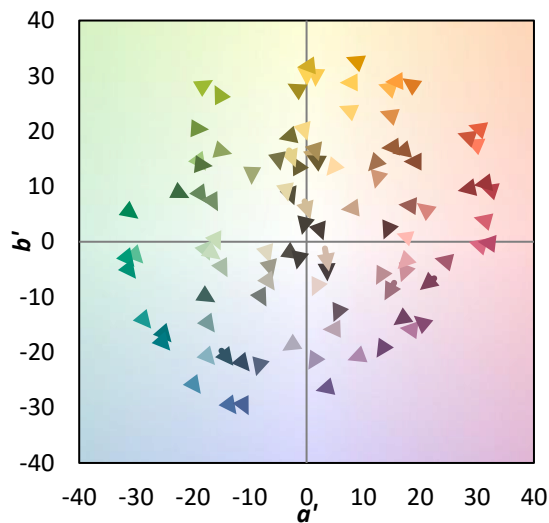
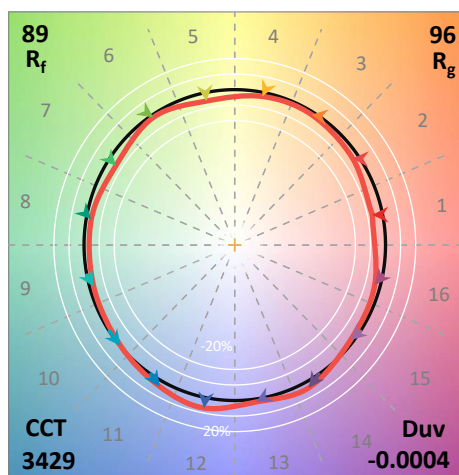
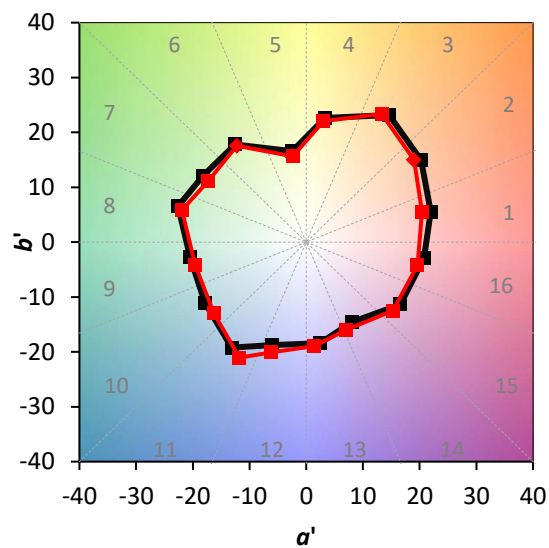
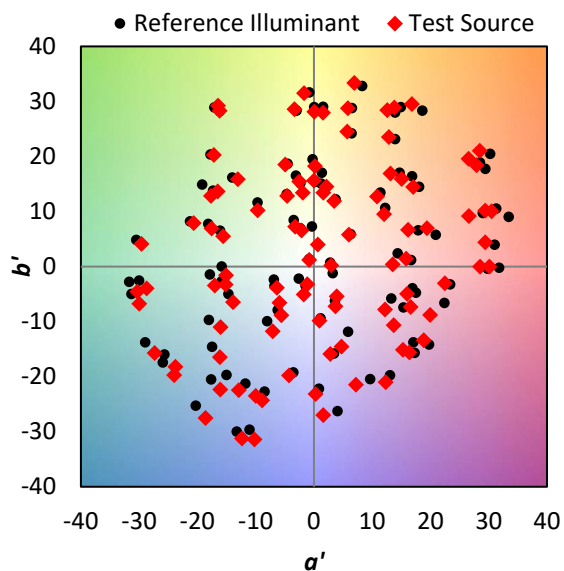
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Summary

$R_f = 88.9$
 $R_g = 96.3$
 CIE $R_a = 90.9$
 $R_9 = 50.7$



Color Vector Graphics

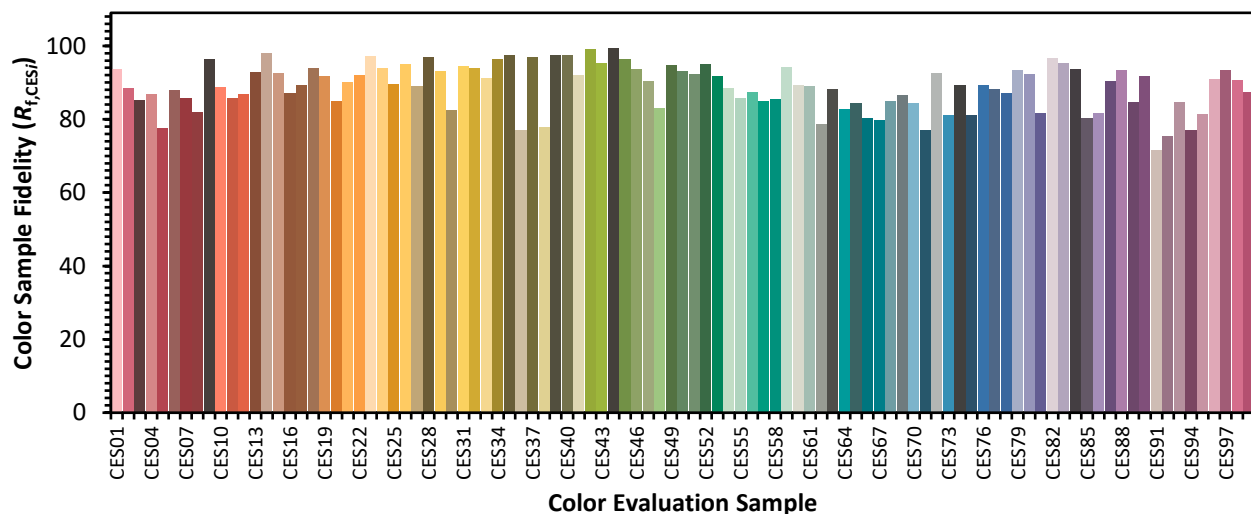


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Individual Sample Fidelity Index ($R_{f,i}$)

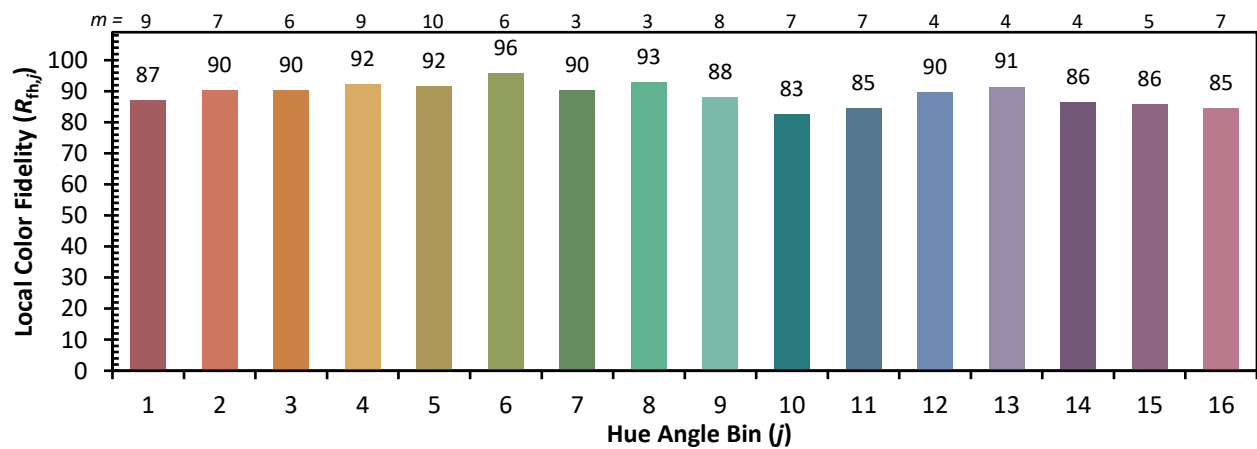
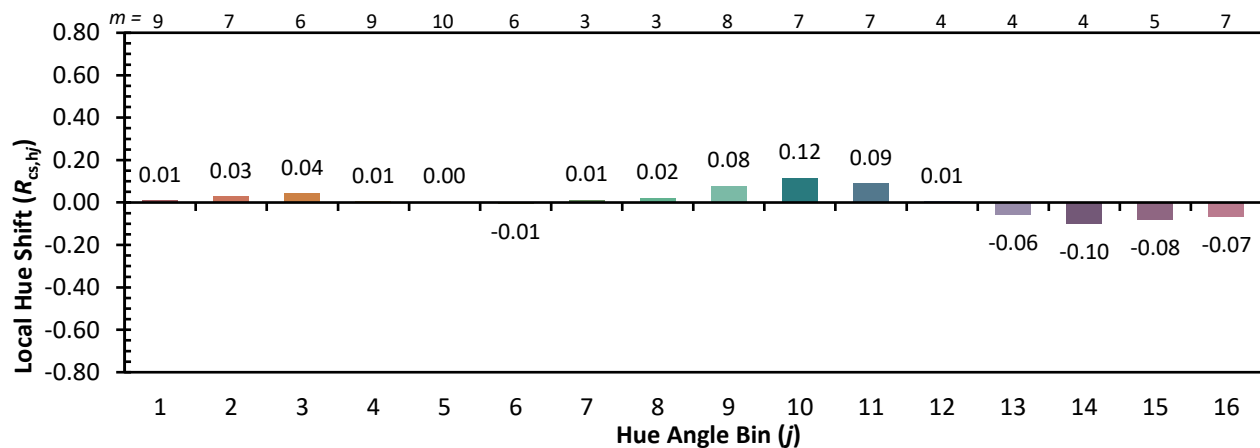
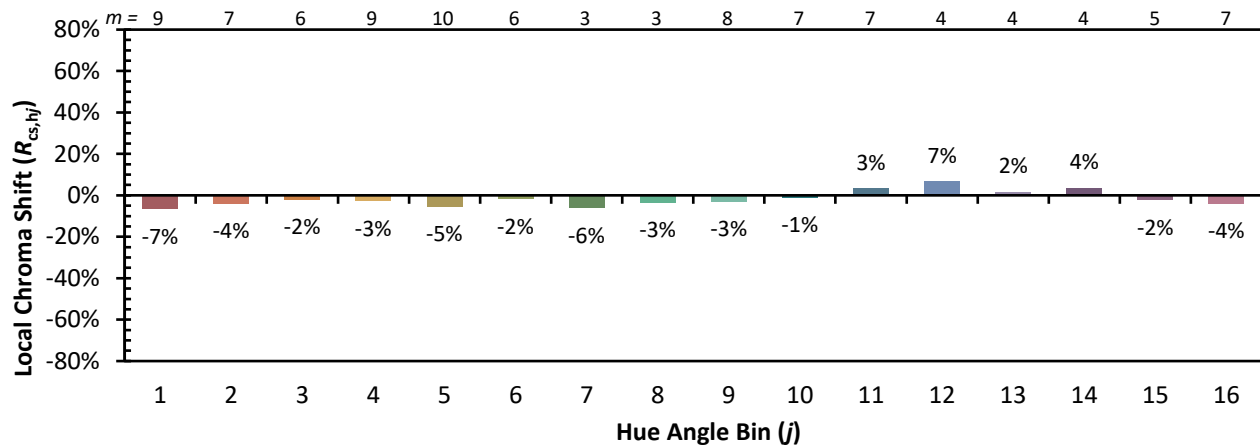
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CES02 = 62	CES27 = 89	CES52 = 95	CES77 = 88
CES03 = 31	CES28 = 97	CES53 = 92	CES78 = 87
CES04 = 70	CES29 = 93	CES54 = 89	CES79 = 93
CES05 = 49	CES30 = 82	CES55 = 86	CES80 = 92
CES06 = 51	CES31 = 95	CES56 = 87	CES81 = 82
CES07 = 42	CES32 = 94	CES57 = 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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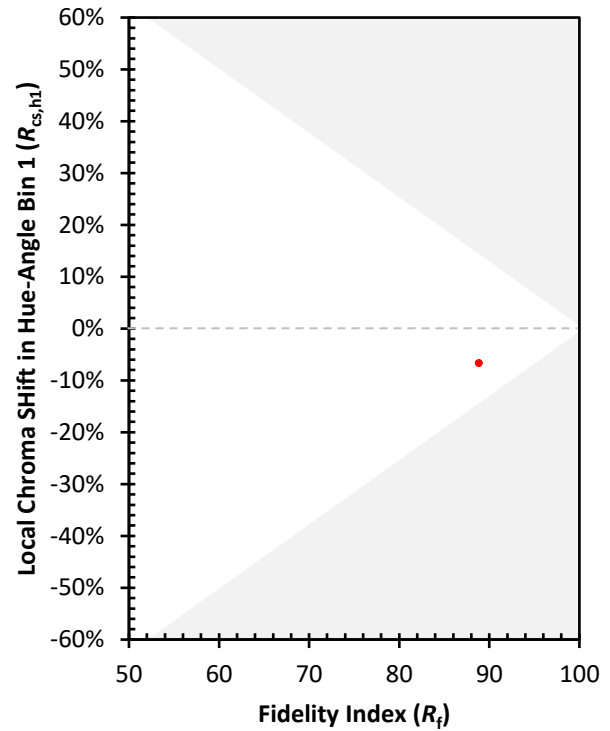
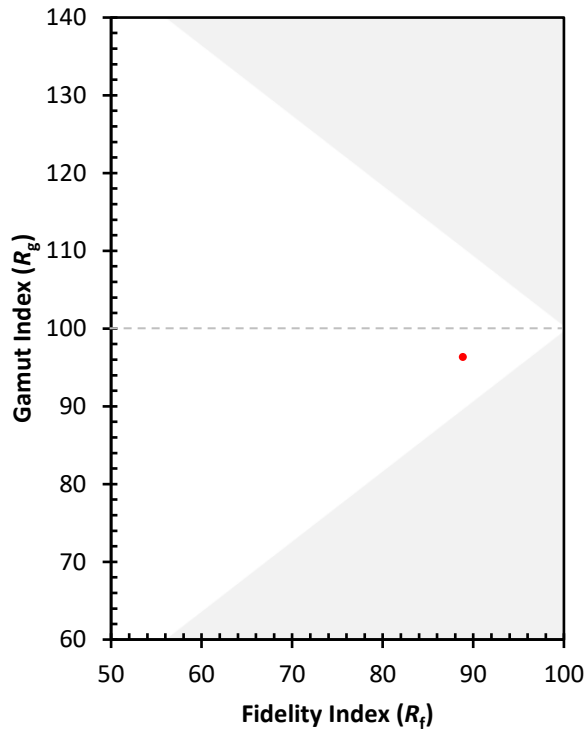
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)