

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: P860287

Luminaire Tested: **SPHB-9SE-M-L740-CD**

Issue Date: 7/11/2024



Test Information

Test Method: LM-79-08
Report Number: P860287
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2404-343-1)
Test Lab: INNOVATION CENTER
Issue Date: 7/11/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: SPHB-9SE-M-L740-CD
Description: 9000 Lumen Standard Efficacy Select Pro High Bay with Medium Lens
and, 4000K 70CRI LEDs
Light Source: -
Ballast/Driver: -

Luminaire Equipment: Sample No. Condition Description

Summary

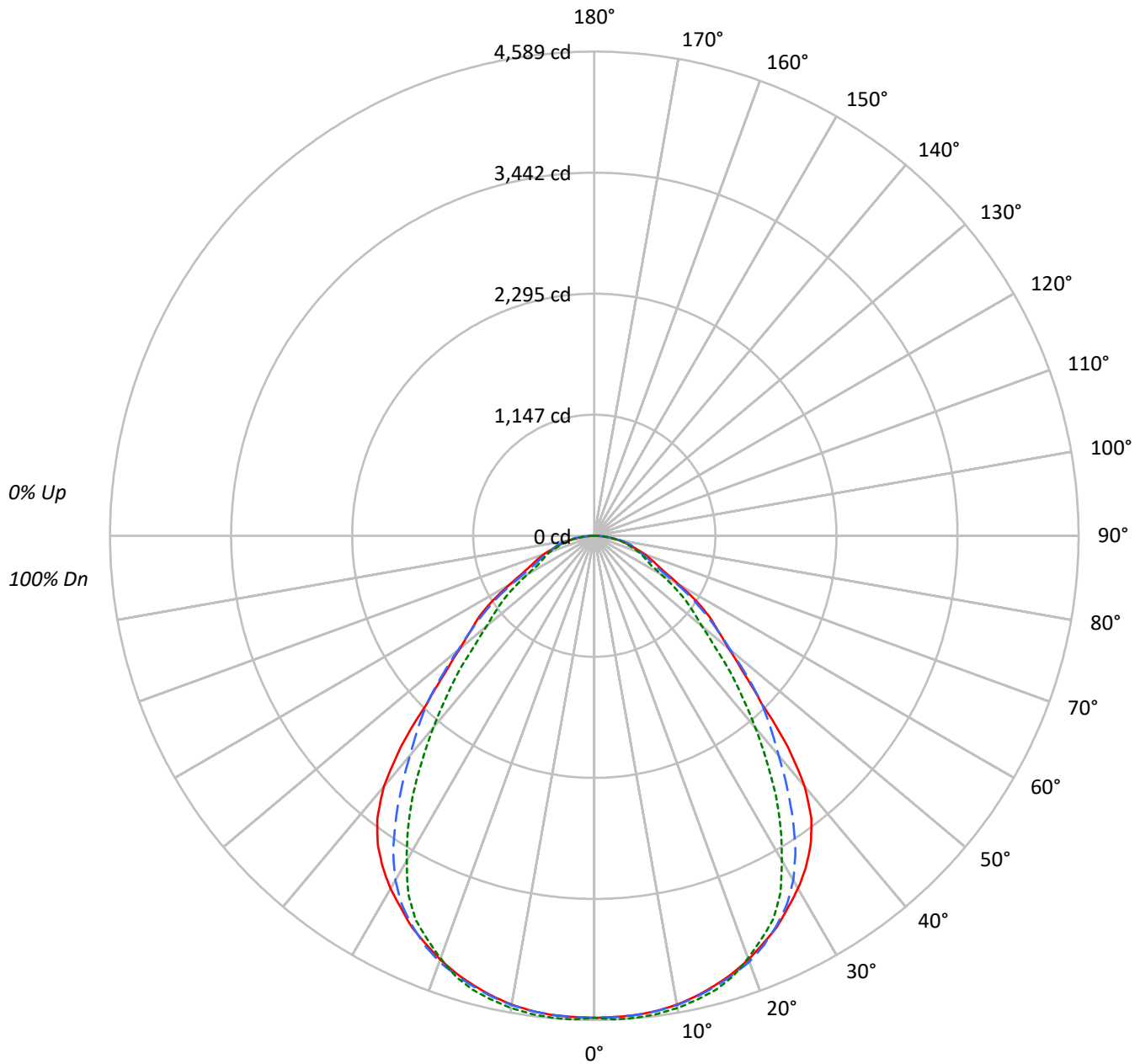
Lumens per Lamp: N/A
Luminaire Lumens: 9482.0 lumens
Efficiency: N/A
Efficacy: 173.0 lumens/watt
Spacing Criteria (0/90/45): 1.25 / 1.16 / 1.22
Luminous Opening: Rectangular (W 1' x L: 1.38' x H: 0')
CIE Type: Direct

Input Watts (W): 54.8
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: SPHB-9SE-M-L740-CD

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					0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10
RCR																				
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100		
1	110	106	103	99	108	104	101	98	100	97	95	96	94	92	92	91	89	87		
2	102	95	89	84	99	93	87	83	89	85	81	86	82	79	83	80	77	75		
3	94	85	78	72	92	83	77	71	80	75	70	78	73	69	75	71	68	66		
4	87	76	69	63	85	75	68	62	73	66	61	70	65	61	68	64	60	58		
5	81	69	61	55	79	68	61	55	66	59	54	64	58	54	62	57	53	51		
6	75	63	55	49	73	62	54	49	60	54	48	59	53	48	57	52	48	46		
7	70	58	50	44	68	57	49	44	55	49	44	54	48	43	53	47	43	41		
8	66	53	45	40	64	52	45	40	51	44	39	50	44	39	49	43	39	37		
9	61	49	41	36	60	48	41	36	47	41	36	46	40	36	45	40	36	34		
10	58	45	38	33	57	45	38	33	44	37	33	43	37	33	42	37	33	31		

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	35632	35632	35632
5°	35702	35693	35895
10°	35733	35771	35990
15°	35629	35721	35970
20°	35473	35653	35369
25°	35214	35115	34519
30°	34768	33949	32011
35°	34038	31233	28531
40°	31588	27643	24165
45°	24644	24710	19999
50°	20128	20413	16150
55°	18033	17353	14192
60°	14438	13667	11354
65°	12098	11076	10042
70°	11487	10552	10224
75°	10421	11205	9861
80°	10475	11450	10394
85°	9111	10677	8681



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	434.4	4.6
10°-20°	1249.2	13.2
20°-30°	1864.9	19.7
30°-40°	2034.9	21.5
40°-50°	1664.6	17.6
50°-60°	1094.5	11.5
60°-70°	627.9	6.6
70°-80°	380.5	4.0
80°-90°	127.8	1.3
90°-100°	3.3	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°	3548.4	37.4
0°-40°	5583.3	58.9
0°-60°	8342.4	88.0
0°-90°	9478.7	100.0
90°-120°	3.3	0.0
90°-150°	3.3	0.0
90°-180°	3.0	0.0
0°-180°	9482.0	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	4568	4568	4568	4568	4568	
5°	4560	4553	4559	4577	4584	434
15°	4412	4412	4424	4452	4454	1245
25°	4092	4101	4080	4031	4011	1882
35°	3575	3494	3280	3056	2996	2216
45°	2234	2401	2240	1977	1813	1773
55°	1326	1290	1276	1097	1044	1168
65°	656	646	600	584	544	670
75°	346	374	372	357	327	374
85°	102	116	119	104	97	110
90°	1	8	17	20	21	5
95°	1	1	2	2	1	0
105°	0	0	0	0	0	0
115°	0	0	0	0	0	0
125°	0	0	0	0	0	0
135°	0	0	0	0	0	0
145°	0	0	0	0	0	0
155°	0	0	0	0	0	0
165°	0	0	0	0	0	0
175°	0	0	0	0	0	0
180°	0	0	0	0	0	



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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	4568.2	4568.2	4568.2	4568.2	4568.2
2.5°	4565.2	4558.6	4564.6	4583.3	4588.7
5°	4559.8	4552.6	4558.6	4577.3	4584.5
7.5°	4541.1	4536.9	4542.9	4561.6	4570.7
10°	4511.6	4506.8	4516.4	4532.7	4544.1
12.5°	4467.6	4465.8	4474.9	4498.4	4503.2
15°	4412.2	4411.6	4423.6	4452.0	4454.4
17.5°	4349.5	4348.9	4364.0	4382.7	4376.0
20°	4273.6	4277.8	4295.3	4277.8	4261.0
22.5°	4182.6	4195.9	4200.1	4145.3	4136.8
25°	4091.7	4101.3	4080.2	4030.8	4010.9
27.5°	3974.2	3985.6	3946.5	3876.0	3819.3
30°	3860.3	3849.5	3769.3	3633.1	3554.2
32.5°	3729.6	3691.0	3547.0	3359.0	3287.3
35°	3574.7	3494.0	3280.1	3056.5	2996.3
37.5°	3378.9	3231.3	2997.5	2764.3	2673.3
40°	3102.3	2931.8	2714.9	2473.9	2373.3
42.5°	2714.9	2651.7	2472.1	2201.0	2081.1
45°	2234.1	2401.0	2240.1	1977.4	1813.0
47.5°	1912.4	2144.3	1950.9	1761.1	1534.6
50°	1658.7	1818.4	1682.2	1511.1	1330.9
52.5°	1475.6	1523.8	1468.9	1280.9	1178.5
55°	1326.1	1290.0	1276.1	1096.6	1043.6
57.5°	1140.6	1120.7	1085.1	956.2	886.3
60°	925.5	967.6	876.1	839.3	727.8
62.5°	760.4	801.9	703.7	701.3	608.5
65°	655.5	645.9	600.1	583.8	544.1
67.5°	580.2	550.1	534.4	513.3	499.5
70°	503.7	491.0	462.7	466.9	448.3
72.5°	420.0	436.2	407.9	415.7	382.0
75°	345.8	374.2	371.8	356.7	327.2
77.5°	285.0	315.1	320.5	306.7	282.6
80°	233.2	253.7	254.9	246.4	231.4
82.5°	171.1	183.2	192.2	177.7	168.1
85°	101.8	115.7	119.3	104.2	97.0
87.5°	33.1	46.4	51.8	53.6	54.2
90°	0.6	8.4	16.9	19.9	21.1
92.5°	0.6	2.4	3.6	5.4	6.0
95°	0.6	1.2	1.8	1.8	1.2
97.5°	0.0	0.0	0.0	0.0	0.0
100°	0.0	0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0.0	0.0	0.0
105°	0.0	0.0	0.0	0.0	0.0



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	0.0	0.0	0.0	0.0	0.0
115°	0.0	0.0	0.0	0.0	0.0
117.5°	0.0	0.0	0.0	0.0	0.0
120°	0.0	0.0	0.0	0.0	0.0
122.5°	0.0	0.0	0.0	0.0	0.0
125°	0.0	0.0	0.0	0.0	0.0
127.5°	0.0	0.0	0.0	0.0	0.0
130°	0.0	0.0	0.0	0.0	0.0
132.5°	0.0	0.0	0.0	0.0	0.0
135°	0.0	0.0	0.0	0.0	0.0
137.5°	0.0	0.0	0.0	0.0	0.0
140°	0.0	0.0	0.0	0.0	0.0
142.5°	0.0	0.0	0.0	0.0	0.0
145°	0.0	0.0	0.0	0.0	0.0
147.5°	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180° - - 45°-225° - - - 90°-270°







107.5°	0.0	0.0	0.0	0.0	0.0
110°	0.0	0.0	0.0	0.0	0.0



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2404-343-2

Test Date: 05/18/2024

Luminaire Tested: SPHB-24SE-M-UNV-L740-CD

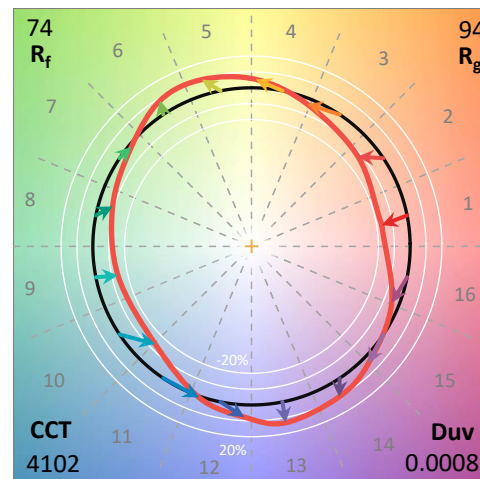
Data in this report applies to families of products SPHB-24SE-M-UNV-L740-CD.

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2404-343-2
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 05/21/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: METALUX
 Catalog Number: **SPHB-24SE-M-UNV-L740-CD**
 Description: 18IN SPHB WITH MEDIUM LENS, 4000K/70CRI, 24K LUMENS, SE

Spectral Parameters

CCT (K):	4102	CRI (Ra):	71.8		
CIE u':	0.2228	R1:	68.8	R9:	-28.8
CIE v':	0.5006	R2:	78.2	R10:	48.0
Duv:	0.0008	R3:	85.2	R11:	66.0
CIE x:	0.3764	R4:	70.9	R12:	40.8
CIE y:	0.3759	R5:	68.5	R13:	70.2
CIE z:	0.2476	R6:	68.8	R14:	91.5
Peak Wavelength (nm):	449	R7:	81.1		
Dominant Wavelength (nm):	578	R8:	53.2		
Purity:	25.9				
Rf:	73.6				
Rg:	94.1				



Test Conditions

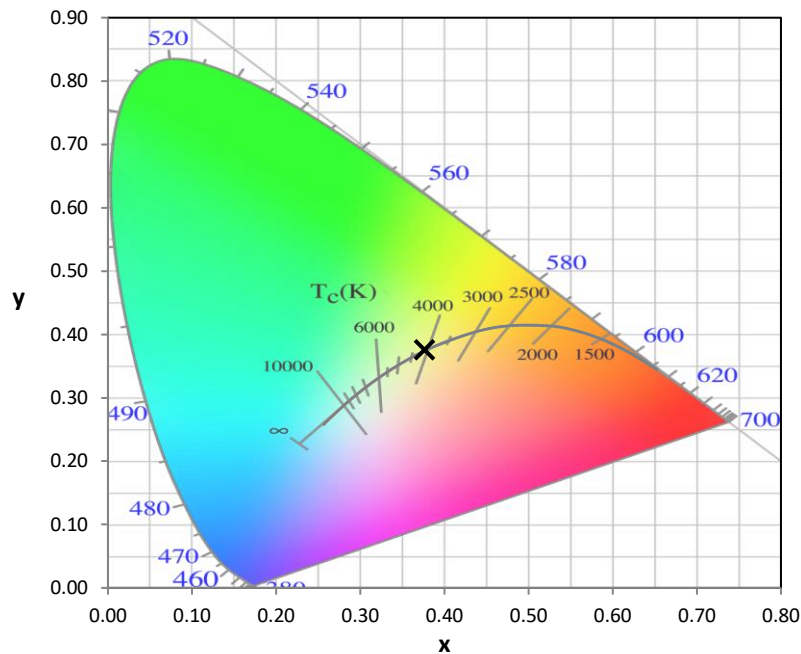
Stabilization Time: 23M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.0/42%
 Sphere Temperature (°C): 25.2

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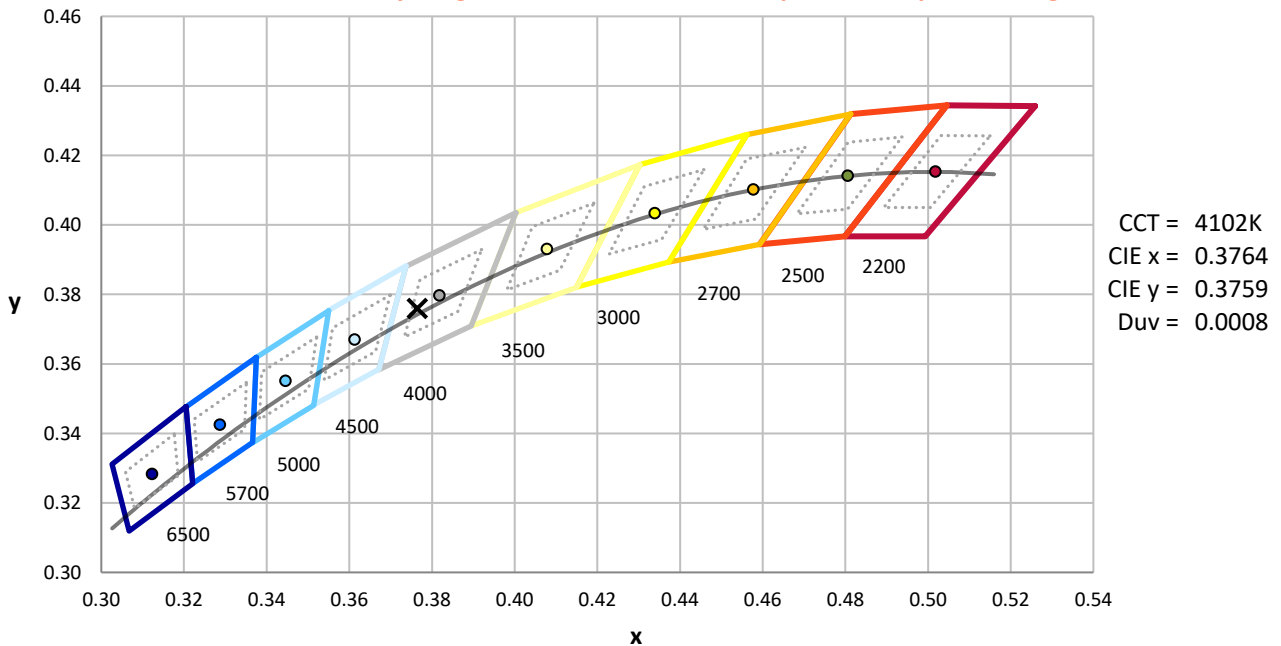
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	2/12/2024	8/12/2024
Power Meter	XITRON 2801 IN0071	10/23/2023	10/23/2024
AC Power Source	CHROMA 61603 IN0063	10/24/2023	10/24/2024
DC Power Source	AGILENT E3634A IN0208	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



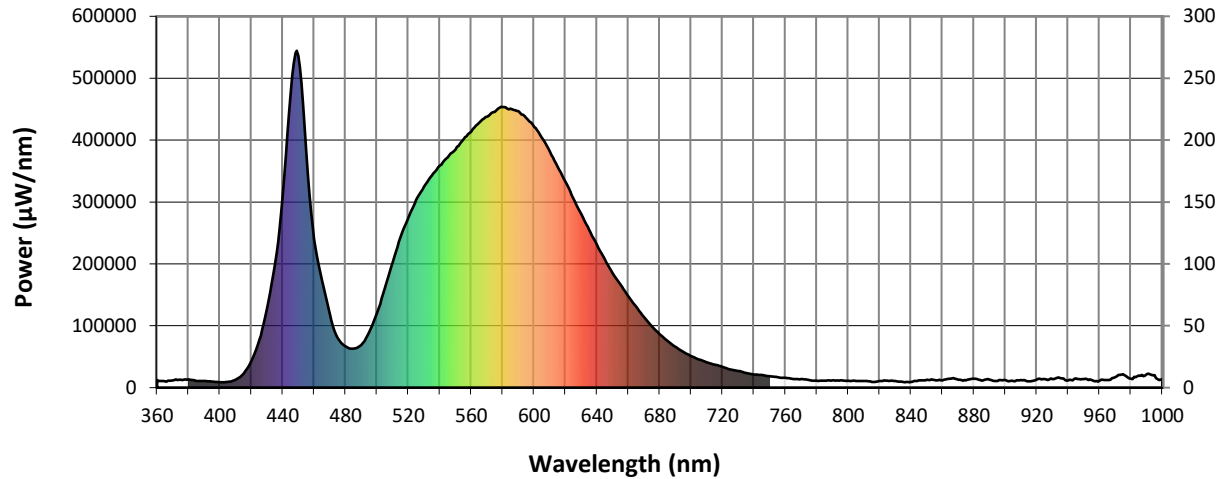
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

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Photopic Flux vs. Wavelength

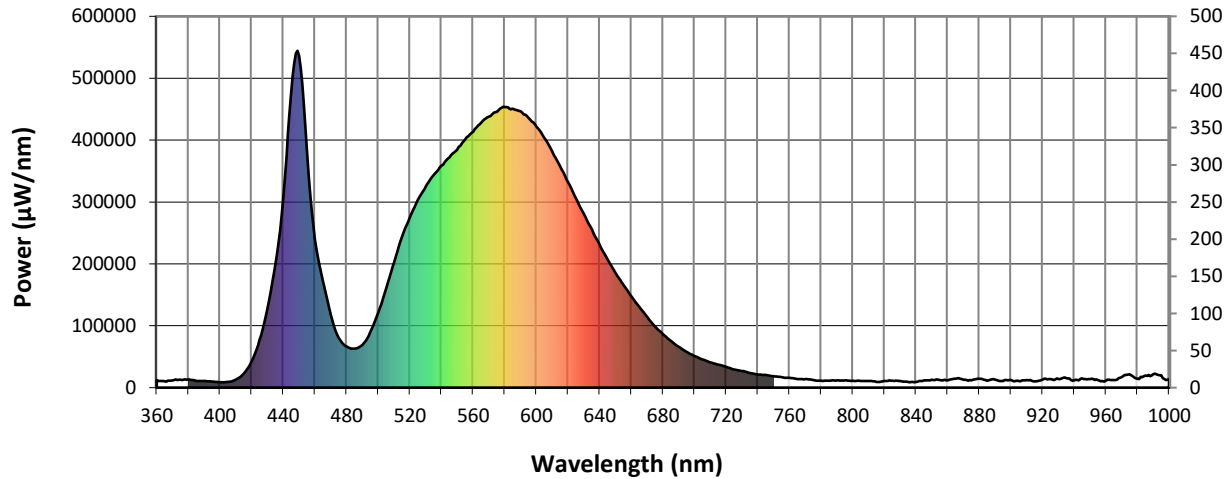


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λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	12282	NR	490	69244	NR	620	332236	NR	750	18473	NR	880	14144	NR
365	9993	NR	495	89219	NR	625	306164	NR	755	17093	NR	885	11383	NR
370	11592	NR	500	120957	NR	630	280415	NR	760	15783	NR	890	12631	NR
375	12885	NR	505	160415	NR	635	255776	NR	765	14109	NR	895	10943	NR
380	13155	NR	510	202325	NR	640	230858	NR	770	13714	NR	900	12076	NR
385	10524	NR	515	242772	NR	645	207176	NR	775	12109	NR	905	10813	NR
390	10533	NR	520	275166	NR	650	185102	NR	780	11079	NR	910	12050	NR
395	9702	NR	525	303387	NR	655	166605	NR	785	11015	NR	915	10223	NR
400	8761	NR	530	324891	NR	660	147603	NR	790	11633	NR	920	13013	NR
405	9408	NR	535	343444	NR	665	130499	NR	795	11716	NR	925	13830	NR
410	12905	NR	540	358519	NR	670	114031	NR	800	11203	NR	930	13673	NR
415	22586	NR	545	372186	NR	675	98947	NR	805	11009	NR	935	15350	NR
420	42669	NR	550	384765	NR	680	86467	NR	810	10663	NR	940	11647	NR
425	76871	NR	555	400929	NR	685	75462	NR	815	9337	NR	945	14902	NR
430	127767	NR	560	413604	NR	690	66059	NR	820	10799	NR	950	13879	NR
435	199683	NR	565	427985	NR	695	57993	NR	825	11459	NR	955	12239	NR
440	309359	NR	570	437799	NR	700	51050	NR	830	10962	NR	960	11457	NR
445	475498	NR	575	445619	NR	705	45397	NR	835	9293	NR	965	12396	NR
450	536068	NR	580	453529	NR	710	40983	NR	840	9002	NR	970	16946	NR
455	378779	NR	585	450693	NR	715	37088	NR	845	11803	NR	975	21468	NR
460	240574	NR	590	446550	NR	720	33495	NR	850	12750	NR	980	14395	NR
465	173120	NR	595	435850	NR	725	29505	NR	855	12369	NR	985	19422	NR
470	117570	NR	600	421525	NR	730	26895	NR	860	11712	NR	990	21623	NR
475	80285	NR	605	403930	NR	735	23678	NR	865	14509	NR	995	20190	NR
480	66424	NR	610	381413	NR	740	21288	NR	870	12667	NR	1000	13819	NR
485	63033	NR	615	357334	NR	745	20448	NR	875	11947	NR			

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Scotopic Flux vs. Wavelength



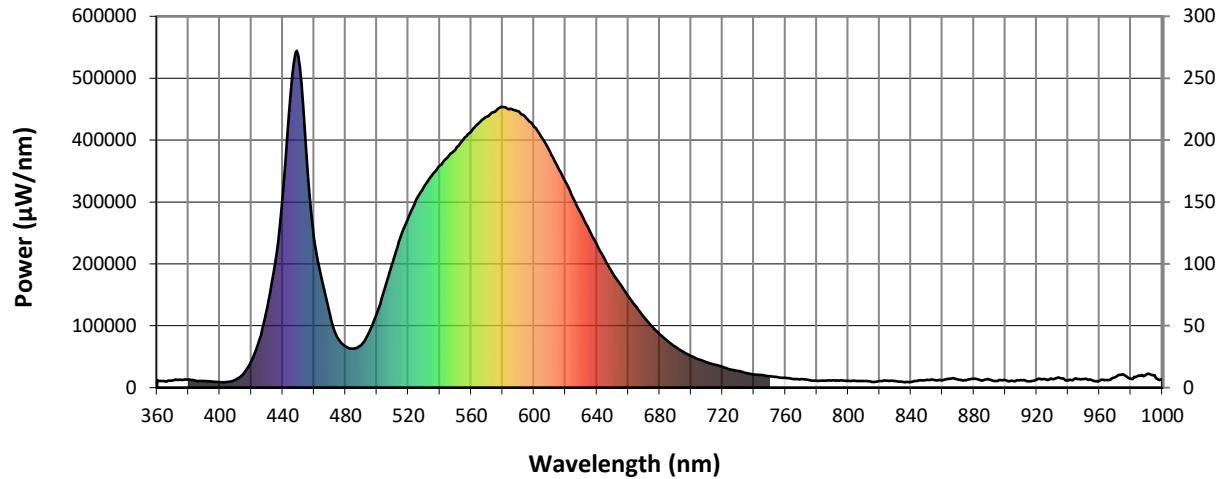
Scotopic Lumens: 39135.7

S/P: 1.54

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	12282	NR	490	69244	NR	620	332236	NR	750	18473	NR	880	14144	NR
365	9993	NR	495	89219	NR	625	306164	NR	755	17093	NR	885	11383	NR
370	11592	NR	500	120957	NR	630	280415	NR	760	15783	NR	890	12631	NR
375	12885	NR	505	160415	NR	635	255776	NR	765	14109	NR	895	10943	NR
380	13155	NR	510	202325	NR	640	230858	NR	770	13714	NR	900	12076	NR
385	10524	NR	515	242772	NR	645	207176	NR	775	12109	NR	905	10813	NR
390	10533	NR	520	275166	NR	650	185102	NR	780	11079	NR	910	12050	NR
395	9702	NR	525	303387	NR	655	166605	NR	785	11015	NR	915	10223	NR
400	8761	NR	530	324891	NR	660	147603	NR	790	11633	NR	920	13013	NR
405	9408	NR	535	343444	NR	665	130499	NR	795	11716	NR	925	13830	NR
410	12905	NR	540	358519	NR	670	114031	NR	800	11203	NR	930	13673	NR
415	22586	NR	545	372186	NR	675	98947	NR	805	11009	NR	935	15350	NR
420	42669	NR	550	384765	NR	680	86467	NR	810	10663	NR	940	11647	NR
425	76871	NR	555	400929	NR	685	75462	NR	815	9337	NR	945	14902	NR
430	127767	NR	560	413604	NR	690	66059	NR	820	10799	NR	950	13879	NR
435	199683	NR	565	427985	NR	695	57993	NR	825	11459	NR	955	12239	NR
440	309359	NR	570	437799	NR	700	51050	NR	830	10962	NR	960	11457	NR
445	475498	NR	575	445619	NR	705	45397	NR	835	9293	NR	965	12396	NR
450	536068	NR	580	453529	NR	710	40983	NR	840	9002	NR	970	16946	NR
455	378779	NR	585	450693	NR	715	37088	NR	845	11803	NR	975	21468	NR
460	240574	NR	590	446550	NR	720	33495	NR	850	12750	NR	980	14395	NR
465	173120	NR	595	435850	NR	725	29505	NR	855	12369	NR	985	19422	NR
470	117570	NR	600	421525	NR	730	26895	NR	860	11712	NR	990	21623	NR
475	80285	NR	605	403930	NR	735	23678	NR	865	14509	NR	995	20190	NR
480	66424	NR	610	381413	NR	740	21288	NR	870	12667	NR	1000	13819	NR
485	63033	NR	615	357334	NR	745	20448	NR	875	11947	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 15130.5 M/P: 0.6

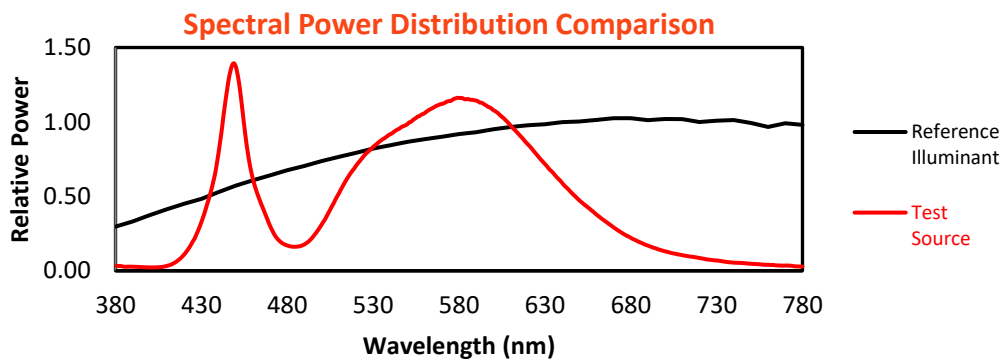
λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	12282	NR	490	69244	NR	620	332236	NR	750	18473	NR	880	14144	NR
365	9993	NR	495	89219	NR	625	306164	NR	755	17093	NR	885	11383	NR
370	11592	NR	500	120957	NR	630	280415	NR	760	15783	NR	890	12631	NR
375	12885	NR	505	160415	NR	635	255776	NR	765	14109	NR	895	10943	NR
380	13155	NR	510	202325	NR	640	230858	NR	770	13714	NR	900	12076	NR
385	10524	NR	515	242772	NR	645	207176	NR	775	12109	NR	905	10813	NR
390	10533	NR	520	275166	NR	650	185102	NR	780	11079	NR	910	12050	NR
395	9702	NR	525	303387	NR	655	166605	NR	785	11015	NR	915	10223	NR
400	8761	NR	530	324891	NR	660	147603	NR	790	11633	NR	920	13013	NR
405	9408	NR	535	343444	NR	665	130499	NR	795	11716	NR	925	13830	NR
410	12905	NR	540	358519	NR	670	114031	NR	800	11203	NR	930	13673	NR
415	22586	NR	545	372186	NR	675	98947	NR	805	11009	NR	935	15350	NR
420	42669	NR	550	384765	NR	680	86467	NR	810	10663	NR	940	11647	NR
425	76871	NR	555	400929	NR	685	75462	NR	815	9337	NR	945	14902	NR
430	127767	NR	560	413604	NR	690	66059	NR	820	10799	NR	950	13879	NR
435	199683	NR	565	427985	NR	695	57993	NR	825	11459	NR	955	12239	NR
440	309359	NR	570	437799	NR	700	51050	NR	830	10962	NR	960	11457	NR
445	475498	NR	575	445619	NR	705	45397	NR	835	9293	NR	965	12396	NR
450	536068	NR	580	453529	NR	710	40983	NR	840	9002	NR	970	16946	NR
455	378779	NR	585	450693	NR	715	37088	NR	845	11803	NR	975	21468	NR
460	240574	NR	590	446550	NR	720	33495	NR	850	12750	NR	980	14395	NR
465	173120	NR	595	435850	NR	725	29505	NR	855	12369	NR	985	19422	NR
470	117570	NR	600	421525	NR	730	26895	NR	860	11712	NR	990	21623	NR
475	80285	NR	605	403930	NR	735	23678	NR	865	14509	NR	995	20190	NR
480	66424	NR	610	381413	NR	740	21288	NR	870	12667	NR	1000	13819	NR
485	63033	NR	615	357334	NR	745	20448	NR	875	11947	NR			

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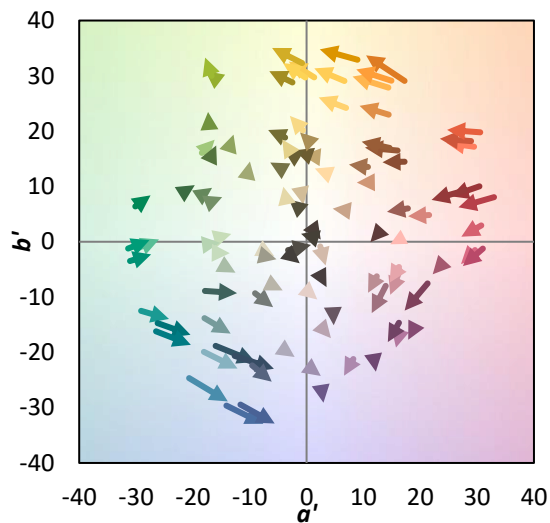
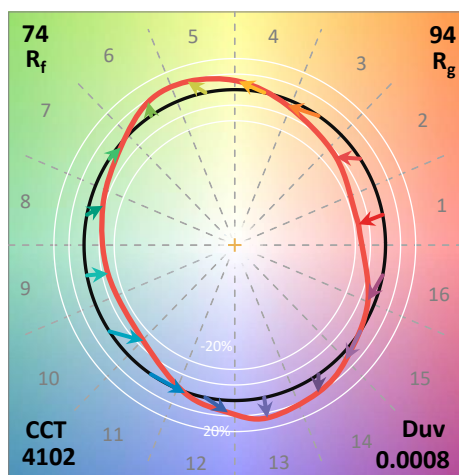
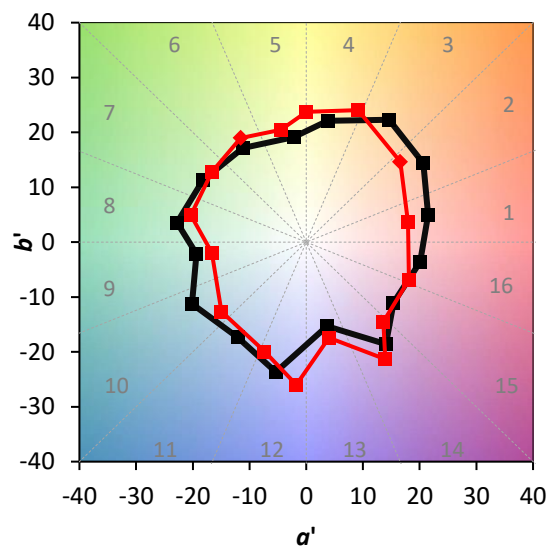
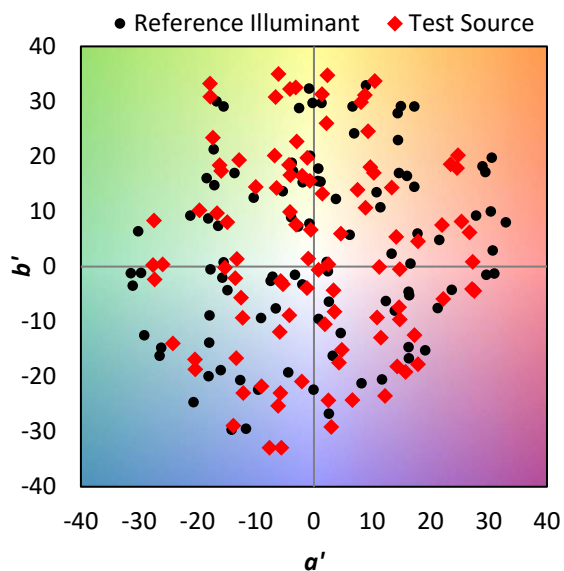
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Summary

$R_f = 73.6$
 $R_g = 94.1$
 CIE $R_a = 71.8$
 $R_g = -28.8$



Color Vector Graphics

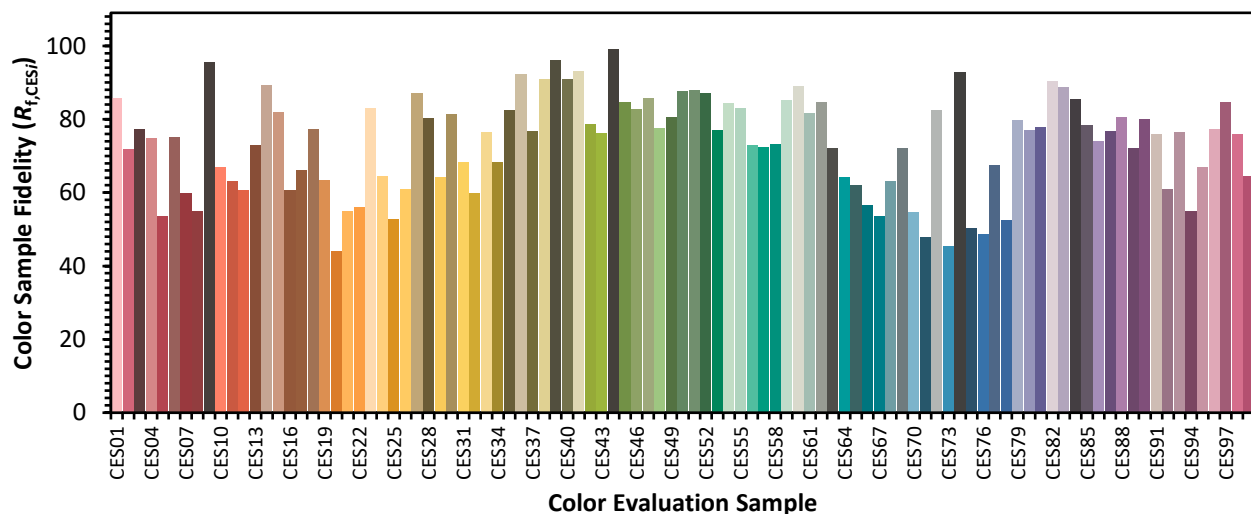


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Individual Sample Fidelity Index ($R_{f,i}$)

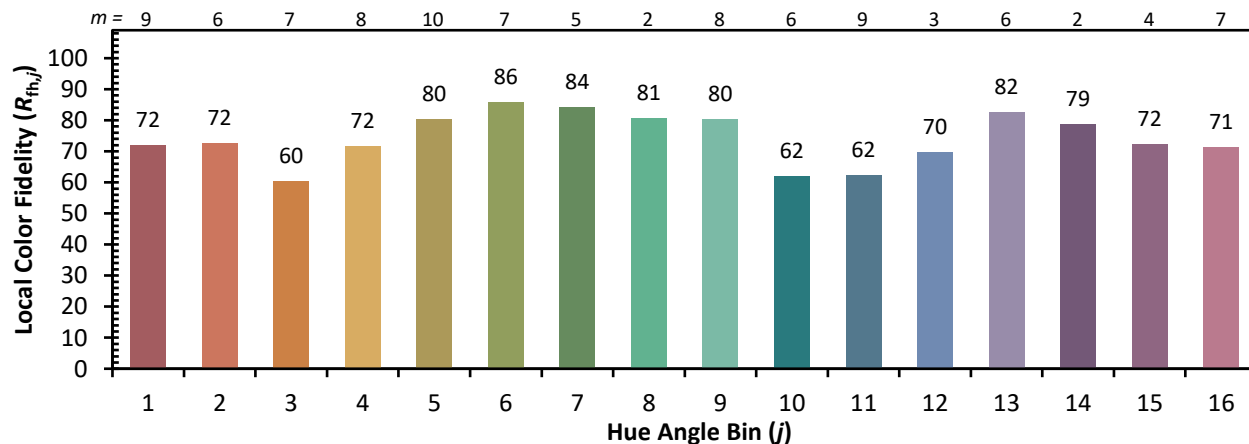
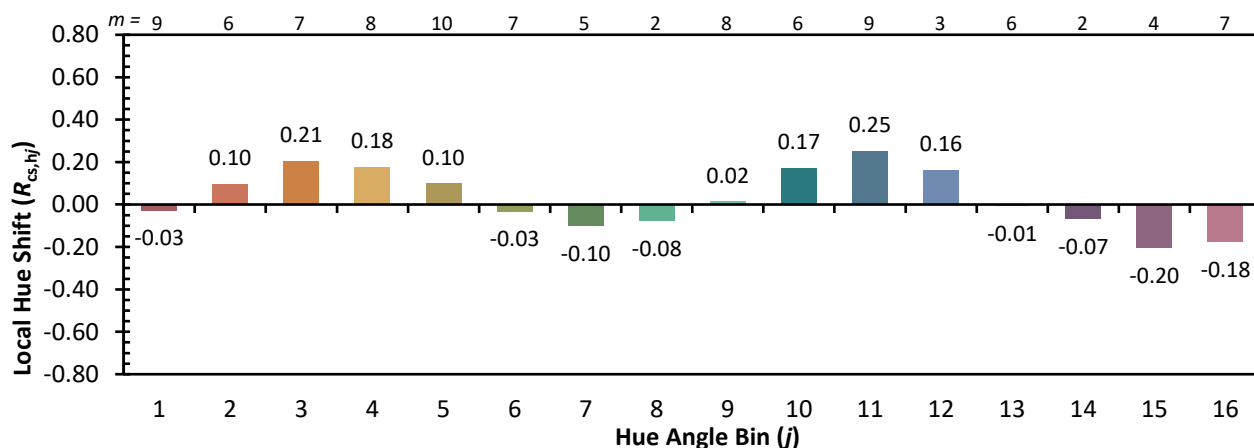
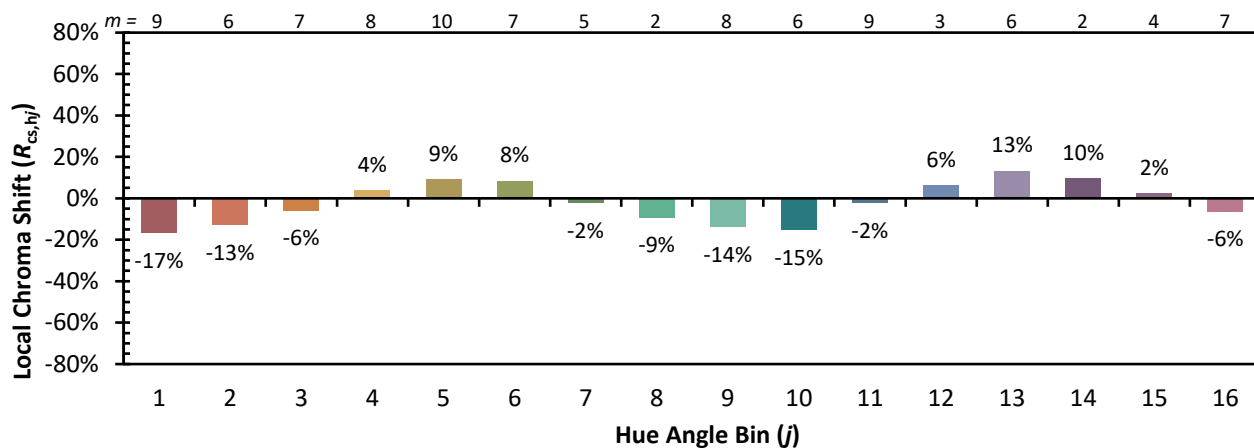
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CES02 = 60	CES27 = 87	CES52 = 87	CES77 = 67
CES03 = 30	CES28 = 80	CES53 = 77	CES78 = 52
CES04 = 70	CES29 = 64	CES54 = 85	CES79 = 80
CES05 = 47	CES30 = 81	CES55 = 83	CES80 = 77
CES06 = 50	CES31 = 68	CES56 = 73	CES81 = 78
CES07 = 40	CES32 = 60	CES57 = 72	CES82 = 90
CES08 = 39	CES33 = 77	CES58 = 73	CES83 = 89
CES09 = 29	CES34 = 68	CES59 = 85	CES84 = 85
CES10 = 74	CES35 = 82	CES60 = 89	CES85 = 78
CES11 = 57	CES36 = 92	CES61 = 82	CES86 = 74
CES12 = 63	CES37 = 77	CES62 = 85	CES87 = 77
CES13 = 42	CES38 = 91	CES63 = 72	CES88 = 81
CES14 = 74	CES39 = 96	CES64 = 64	CES89 = 72
CES15 = 71	CES40 = 91	CES65 = 62	CES90 = 80
CES16 = 46	CES41 = 93	CES66 = 56	CES91 = 76
CES17 = 49	CES42 = 79	CES67 = 54	CES92 = 61
CES18 = 56	CES43 = 76	CES68 = 63	CES93 = 76
CES19 = 71	CES44 = 99	CES69 = 72	CES94 = 55
CES20 = 64	CES45 = 85	CES70 = 55	CES95 = 67
CES21 = 86	CES46 = 83	CES71 = 48	CES96 = 77
CES22 = 78	CES47 = 86	CES72 = 82	CES97 = 85
CES23 = 92	CES48 = 78	CES73 = 45	CES98 = 76
CES24 = 91	CES49 = 81	CES74 = 93	CES99 = 64
CES25 = 72	CES50 = 88	CES75 = 50	



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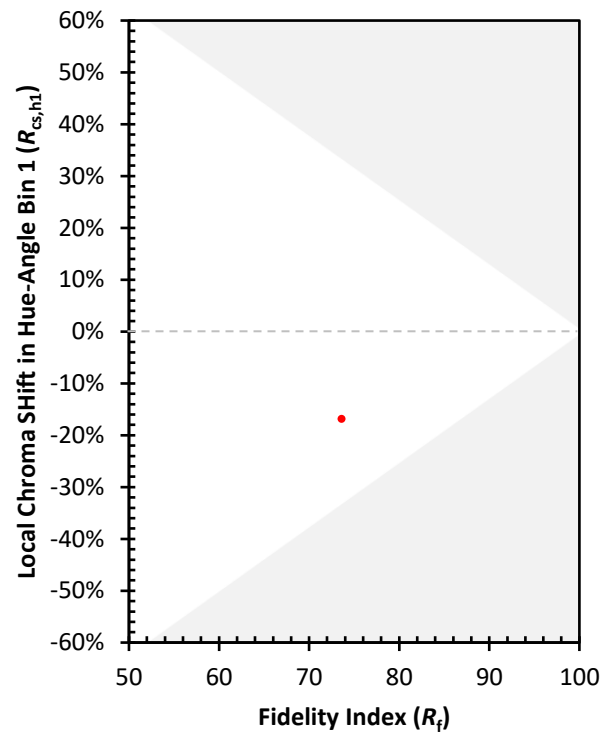
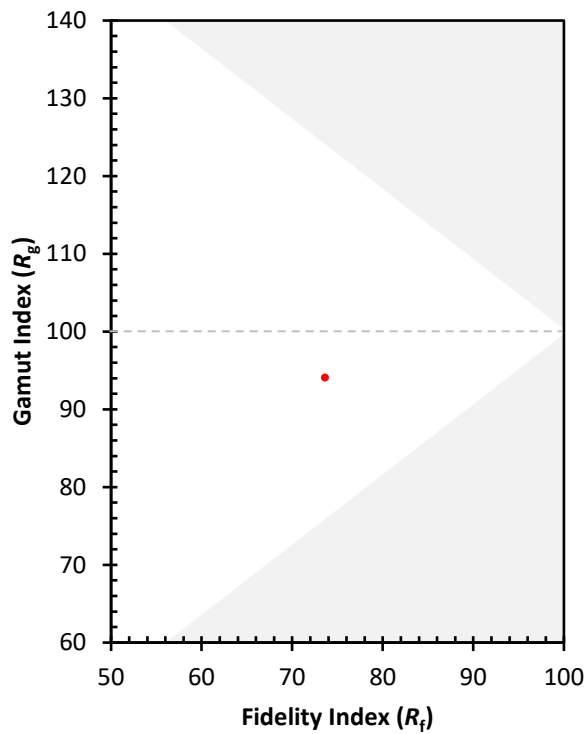
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)