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

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

Test Report Prepared for

Cooper Lighting Solutions

Brand: HALO

Report Number: P1046660

Luminaire Tested: FMNL809FS5-(black trim)-940

Issue Date: 07/03/2025

Tested By:	Approved By:

NVLAP Lab Code: 200050-0

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

NVLAP Lab Code: 200050-0

Test Information

Test Method:	LM-79-2019
Report Number:	P1046660
Test Lab:	Cooper lighting solutions
Issue Date:	07/03/2025
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	HALO
Catalog Number:	FMNL809FS5-(black trim)-940
Description:	HALO 8 inch 90 CRI COLOR SELECTABLE flush mount Black Trim FIXTURE with night light
Light Source:	4000K CCT, 90 CRI LEDS
Ballast/Driver:	-

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	899.9 lumens
Efficiency:	N/A
Efficacy:	88.2 lumens/watt
Spacing Criteria (0/90/45):	1.29 / 1.29 / 1.41
Luminous Opening:	Circular (Dia: 0.7' x H: 0')
CIE Type:	Direct

Input Watts (W):	10.2
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:	24 FT

Measurement and Test Equipment			
Instrument	**Identification Number**	**Calibration Date**	**Calibration Due Date**
Photometer	P3	10/30/2015	4/30/2016
Power Meter	IN0214	1/12/2016	1/12/2017
AC Power Source	IN0062	1/12/2016	1/12/2017
DC Power Supply	--	--	--
Room Thermometer	IN0145	1/13/2016	1/13/2017

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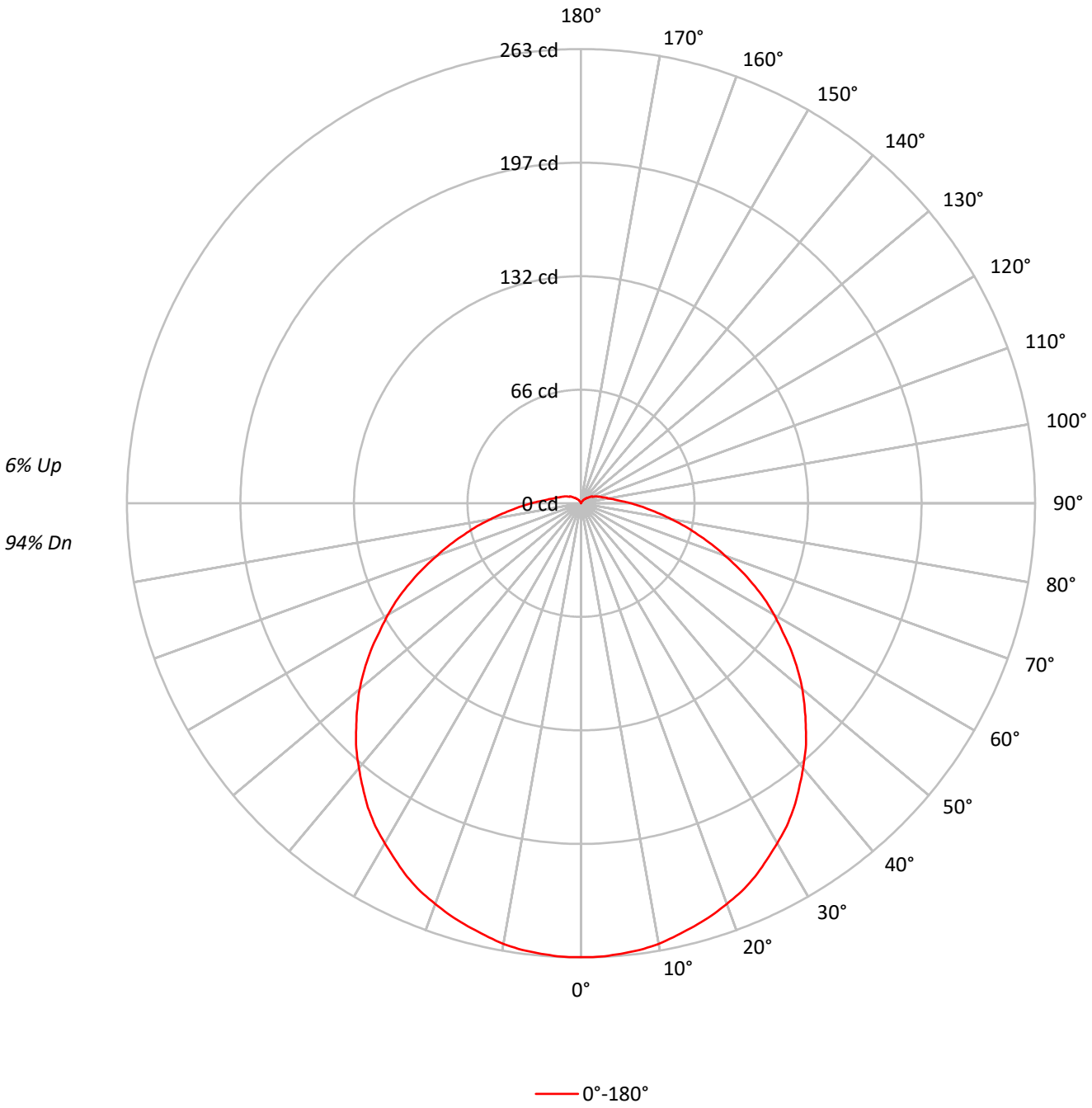
Luminous Intensity Polar Plot



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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	118	118	118	118	114	114	114	114	108	108	108	102	102	102	96	96	96	94
1	106	100	95	91	102	97	93	89	92	88	85	87	84	81	82	80	78	75
2	96	87	79	73	92	84	77	72	79	74	69	75	71	66	71	67	64	61
3	87	76	67	60	84	73	66	59	70	63	57	66	60	55	62	58	54	51
4	79	67	57	50	76	65	56	50	62	54	48	58	52	47	55	50	46	43
5	73	59	50	43	70	58	49	43	55	47	42	52	46	41	50	44	39	37
6	67	53	44	37	65	52	43	37	50	42	36	47	41	35	45	39	35	32
7	62	48	39	33	60	47	39	33	45	37	32	43	36	31	41	35	31	28
8	58	44	35	29	56	43	35	29	41	34	28	39	33	28	38	32	27	25
9	54	40	32	26	52	39	31	26	38	31	26	36	30	25	35	29	25	23
10	50	37	29	24	49	36	29	24	35	28	23	34	27	23	32	26	22	20

AVERAGE LUMINANCE (cd/sqm):

	0°
0°	7350
5°	7353
10°	7359
15°	7340
20°	7349
25°	7360
30°	7341
35°	7344
40°	7306
45°	7286
50°	7284
55°	7251
60°	7222
65°	7240
70°	7262
75°	7575
80°	8585
85°	12612

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
Vertical Angle: 87.5°
Luminance: 21609 cd/sqm

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	24.9	2.8
10°-20°	71.6	8.0
20°-30°	109.9	12.2
30°-40°	134.4	14.9
40°-50°	142.2	15.8
50°-60°	132.8	14.8
60°-70°	108.2	12.0
70°-80°	74.5	8.3
80°-90°	43.6	4.8
90°-100°	23.5	2.6
100°-110°	14.3	1.6
110°-120°	9.3	1.0
120°-130°	5.8	0.6
130°-140°	3.1	0.3
140°-150°	1.3	0.2
150°-160°	0.4	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	206.4	22.9
0°-40°	340.8	37.9
0°-60°	615.9	68.4
0°-90°	842.2	93.6
90°-120°	47.1	5.2
90°-150°	57.3	6.4
90°-180°	58.0	6.4
0°-180°	899.9	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	263	
5°	262	25
15°	254	72
25°	238	110
35°	215	134
45°	184	142
55°	149	133
65°	109	108
75°	70	75
85°	39	35
90°	29	16
95°	21	16
105°	13	14
115°	9	9
125°	6	6
135°	4	3
145°	2	1
155°	1	0
165°	0	0
175°	0	0
180°	0	

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CANDELA DISTRIBUTION (FULL):

	0°
0°	262.8
2.5°	262.8
5°	261.9
7.5°	260.9
10°	259.1
12.5°	256.3
15°	253.5
17.5°	250.6
20°	246.9
22.5°	243.2
25°	238.5
27.5°	232.9
30°	227.3
32.5°	221.7
35°	215.1
37.5°	207.6
40°	200.1
42.5°	192.7
45°	184.2
47.5°	175.8
50°	167.4
52.5°	158.1
55°	148.7
57.5°	138.4
60°	129.1
62.5°	119.7
65°	109.4
67.5°	99.1
70°	88.8
72.5°	79.5
75°	70.1
77.5°	61.7
80°	53.3
82.5°	45.8
85°	39.3
87.5°	33.7
90°	29.0
92.5°	24.3
95°	20.6
97.5°	18.7
100°	15.9
102.5°	15.0
105°	13.1
107.5°	12.2
110°	11.2

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CANDELA DISTRIBUTION (continued):

	0°
112.5°	*10.3*
115°	*9.4*
117.5°	*8.4*
120°	*7.5*
122.5°	*7.5*
125°	*6.5*
127.5°	*5.6*
130°	*4.7*
132.5°	*4.7*
135°	*3.7*
137.5°	*3.7*
140°	*2.8*
142.5°	*2.8*
145°	*1.9*
147.5°	*1.9*
150°	*0.9*
152.5°	*0.9*
155°	*0.9*
157.5°	*0.9*
160°	*0.0*
162.5°	*0.0*
165°	*0.0*
167.5°	*0.0*
170°	*0.0*
172.5°	*0.0*
175°	*0.0*
177.5°	*0.0*
180°	*0.0*

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CIE UGR TABLE:

Reflectances:											
	Ceiling	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
	Wall	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
	Reference plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room Dimensions		Viewed crosswise					Viewed endwise				
X=2H	Y=2H	18.5	20.0	19.0	20.5	21.0	18.5	20.0	19.0	20.5	21.0
	3H	20.6	22.0	21.1	22.5	23.0	20.6	22.0	21.1	22.5	23.0
	4H	21.5	22.9	22.0	23.3	23.9	21.5	22.9	22.0	23.3	23.9
	6H	22.4	23.7	22.9	24.2	24.7	22.4	23.7	22.9	24.2	24.7
	8H	22.9	24.0	23.4	24.6	25.1	22.9	24.0	23.4	24.6	25.1
	12H	23.3	24.5	23.9	25.0	25.6	23.3	24.5	23.9	25.0	25.6
4H	2H	19.2	20.5	19.7	21.0	21.5	19.2	20.5	19.7	21.0	21.5
	3H	21.5	22.7	22.1	23.2	23.7	21.5	22.7	22.1	23.2	23.7
	4H	22.6	23.7	23.2	24.2	24.8	22.6	23.7	23.2	24.2	24.8
	6H	23.7	24.6	24.3	25.2	25.8	23.7	24.6	24.3	25.2	25.8
	8H	24.2	25.1	24.8	25.7	26.3	24.2	25.1	24.8	25.7	26.3
	12H	24.8	25.6	25.4	26.2	26.8	24.8	25.6	25.4	26.2	26.8
8H	4H	23.1	23.9	23.6	24.5	25.1	23.1	23.9	23.6	24.5	25.1
	6H	24.4	25.1	25.0	25.7	26.3	24.4	25.1	25.0	25.7	26.3
	8H	25.0	25.7	25.6	26.3	26.9	25.0	25.7	25.6	26.3	26.9
	12H	25.8	26.4	26.4	27.0	27.7	25.8	26.4	26.4	27.0	27.7
12H	4H	23.2	24.0	23.7	24.5	25.2	23.2	24.0	23.7	24.5	25.2
	6H	24.5	25.2	25.1	25.8	26.4	24.5	25.2	25.1	25.8	26.4
	8H	25.3	25.9	25.9	26.5	27.2	25.3	25.9	25.9	26.5	27.2

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

Report Prepared for

Cooper Lighting Solutions

Halo Home

Report Number: SP1-2506-468-4

Test Date: 07/08/2025

Luminaire Tested: FMNL809FS5-4000K

Data in this report applies to families of products including FMNL809FS5-4000K

The results of this test have not been influenced by sources from within Eaton or from external interests.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

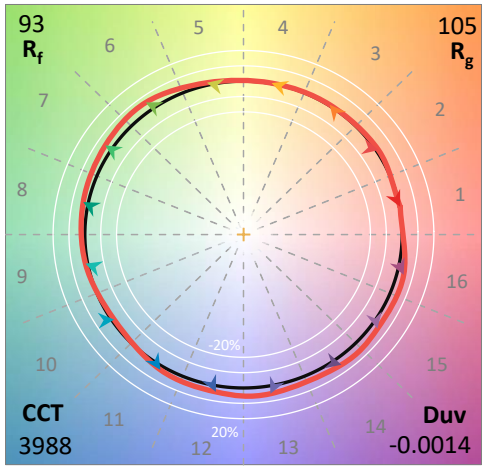
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2506-468-4
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	07/10/2025
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	Halo Home
Catalog Number:	**FMNL809FS5-4000K**
Description:	HALO FLUSH MOUNT NIGHT LIGHT 8 INCH

Spectral Parameters

CCT (K):	3988
CIE u':	0.2261
CIE v':	0.5001
Duv:	-0.0014
CIE x:	0.3800
CIE y:	0.3736
CIE z:	0.2464
Peak Wavelength (nm):	630
Dominant Wavelength (nm):	579
Purity:	26.16583
Rf:	92.8
Rg:	105.2

CRI (Ra):	93.9
R1:	94.4
R2:	98.3
R3:	89.1
R4:	89.2
R5:	96.0
R6:	96.7
R7:	94.7
R8:	92.9
R9:	90.3
R10:	93.6
R11:	85.7
R12:	83.7
R13:	96.6
R14:	92.4
R15:	94.3



Test Conditions

Stabilization Time:	20M
Operation Time:	1H 20M
Sphere Temperature (°C):	24.0

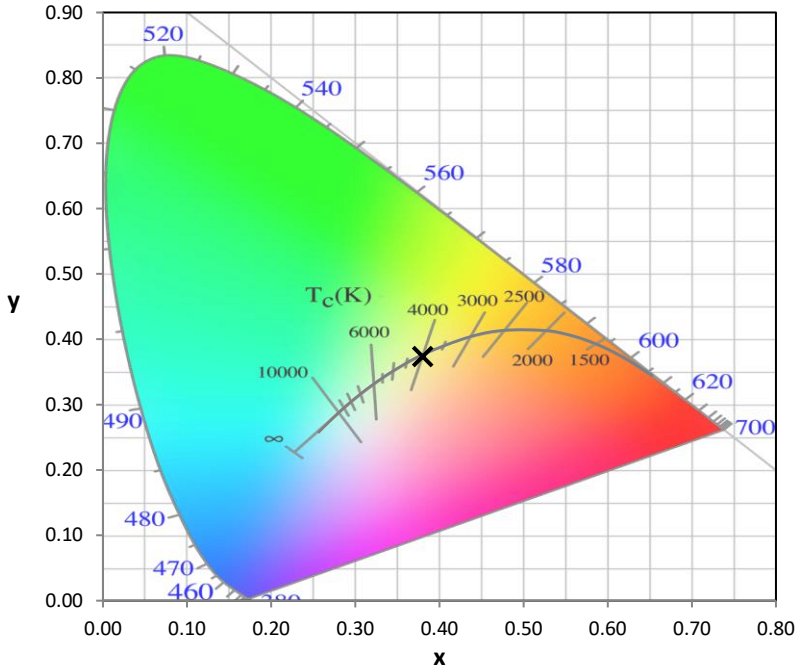
REPORT NUMBER: SP1-2506-468-4

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	6/16/2025	12/16/2025
Power Meter	XITRON INXT2011004	1/21/2025	1/21/2026
AC Power Source	CHROMA 61603 IN0063	10/22/2024	10/22/2025
DC Power Source	AGILENT E3634A IN0208	10/22/2024	10/22/2025
Sphere Thermometer	ONSET IN0085	10/22/2024	10/22/2025
Room Thermometer	ONSET IN0046	10/22/2024	10/22/2025

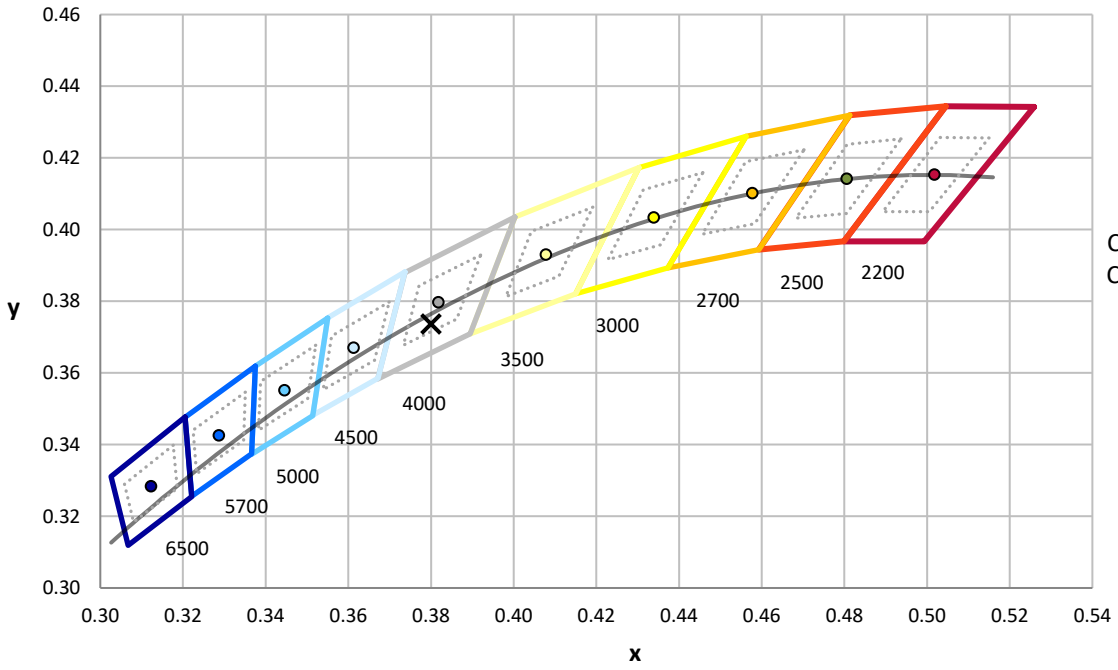
Sample Number	Condition	Description
P2506-468-LM.1	Good	HALO FLUSH MOUNT NIGHT LIGHT 8 INCH

REPORT NUMBER: SP1-2506-468-4

CIE 1931 Chromaticity Diagram



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



CCT = 3988K
CIE x = 0.3800
CIE y = 0.3736
Duv = -0.0014

Point lies inside the ANSI 4000K 4-step quadrangle

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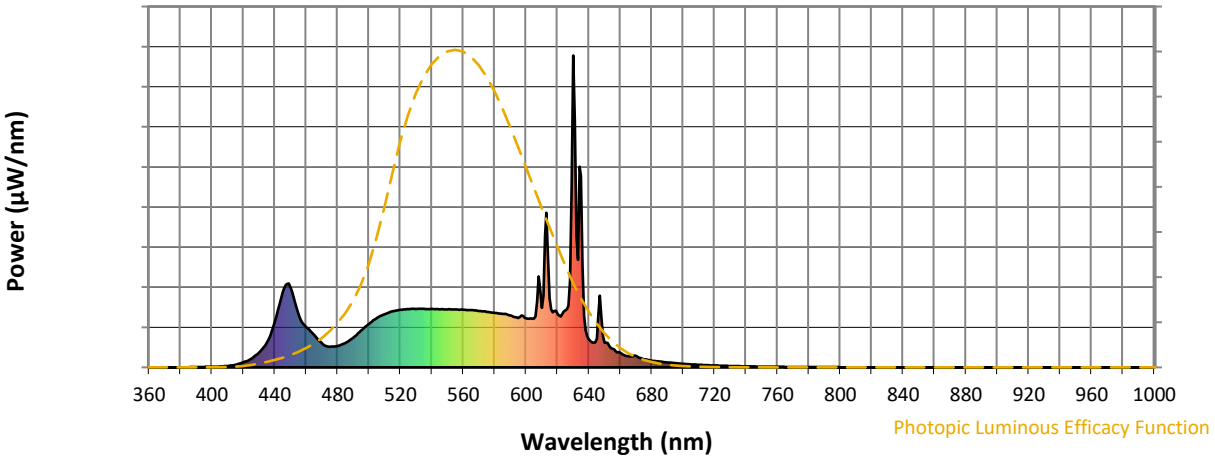
Photopic Flux vs. Wavelength

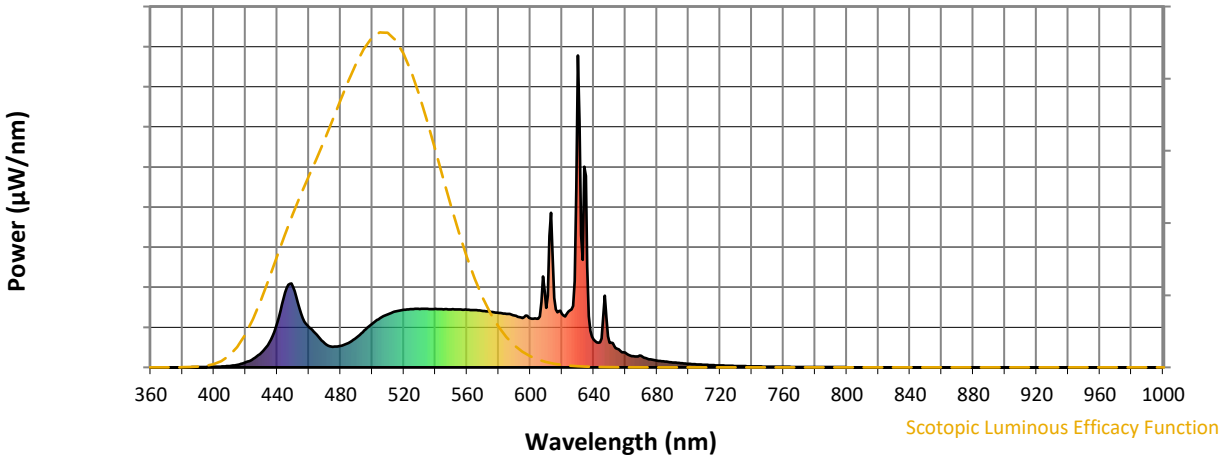


Photopic Lumens: NR

λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)
360	0	NR	490	95	NR	620	171	NR	750	2	NR	880	0	NR
365	0	NR	495	118	NR	625	183	NR	755	2	NR	885	0	NR
370	0	NR	500	140	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	158	NR	635	614	NR	765	2	NR	895	0	NR
380	0	NR	510	171	NR	640	89	NR	770	1	NR	900	0	NR
385	0	NR	515	180	NR	645	93	NR	775	1	NR	905	0	NR
390	1	NR	520	185	NR	650	79	NR	780	1	NR	910	0	NR
395	1	NR	525	186	NR	655	59	NR	785	1	NR	915	0	NR
400	2	NR	530	187	NR	660	47	NR	790	1	NR	920	0	NR
405	3	NR	535	187	NR	665	35	NR	795	1	NR	925	0	NR
410	4	NR	540	187	NR	670	37	NR	800	1	NR	930	0	NR
415	9	NR	545	186	NR	675	26	NR	805	1	NR	935	0	NR
420	16	NR	550	186	NR	680	22	NR	810	0	NR	940	0	NR
425	28	NR	555	186	NR	685	19	NR	815	0	NR	945	0	NR
430	47	NR	560	185	NR	690	16	NR	820	0	NR	950	0	NR
435	80	NR	565	184	NR	695	14	NR	825	0	NR	955	0	NR
440	144	NR	570	181	NR	700	11	NR	830	0	NR	960	0	NR
445	240	NR	575	177	NR	705	10	NR	835	0	NR	965	0	NR
450	258	NR	580	175	NR	710	8	NR	840	0	NR	970	0	NR
455	172	NR	585	172	NR	715	7	NR	845	0	NR	975	0	NR
460	129	NR	590	166	NR	720	6	NR	850	0	NR	980	0	NR
465	105	NR	595	159	NR	725	5	NR	855	0	NR	985	0	NR
470	77	NR	600	157	NR	730	4	NR	860	0	NR	990	0	NR
475	66	NR	605	156	NR	735	4	NR	865	0	NR	995	0	NR
480	69	NR	610	191	NR	740	3	NR	870	0	NR	1000	0	NR
485	78	NR	615	222	NR	745	3	NR	875	0	NR			

REPORT NUMBER: SP1-2506-468-4

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR **S/P: 1.82**

λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)
360	0	NR	490	95	NR	620	171	NR	750	2	NR	880	0	NR
365	0	NR	495	118	NR	625	183	NR	755	2	NR	885	0	NR
370	0	NR	500	140	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	158	NR	635	614	NR	765	2	NR	895	0	NR
380	0	NR	510	171	NR	640	89	NR	770	1	NR	900	0	NR
385	0	NR	515	180	NR	645	93	NR	775	1	NR	905	0	NR
390	1	NR	520	185	NR	650	79	NR	780	1	NR	910	0	NR
395	1	NR	525	186	NR	655	59	NR	785	1	NR	915	0	NR
400	2	NR	530	187	NR	660	47	NR	790	1	NR	920	0	NR
405	3	NR	535	187	NR	665	35	NR	795	1	NR	925	0	NR
410	4	NR	540	187	NR	670	37	NR	800	1	NR	930	0	NR
415	9	NR	545	186	NR	675	26	NR	805	1	NR	935	0	NR
420	16	NR	550	186	NR	680	22	NR	810	0	NR	940	0	NR
425	28	NR	555	186	NR	685	19	NR	815	0	NR	945	0	NR
430	47	NR	560	185	NR	690	16	NR	820	0	NR	950	0	NR
435	80	NR	565	184	NR	695	14	NR	825	0	NR	955	0	NR
440	144	NR	570	181	NR	700	11	NR	830	0	NR	960	0	NR
445	240	NR	575	177	NR	705	10	NR	835	0	NR	965	0	NR
450	258	NR	580	175	NR	710	8	NR	840	0	NR	970	0	NR
455	172	NR	585	172	NR	715	7	NR	845	0	NR	975	0	NR
460	129	NR	590	166	NR	720	6	NR	850	0	NR	980	0	NR
465	105	NR	595	159	NR	725	5	NR	855	0	NR	985	0	NR
470	77	NR	600	157	NR	730	4	NR	860	0	NR	990	0	NR
475	66	NR	605	156	NR	735	4	NR	865	0	NR	995	0	NR
480	69	NR	610	191	NR	740	3	NR	870	0	NR	1000	0	NR
485	78	NR	615	222	NR	745	3	NR	875	0	NR			

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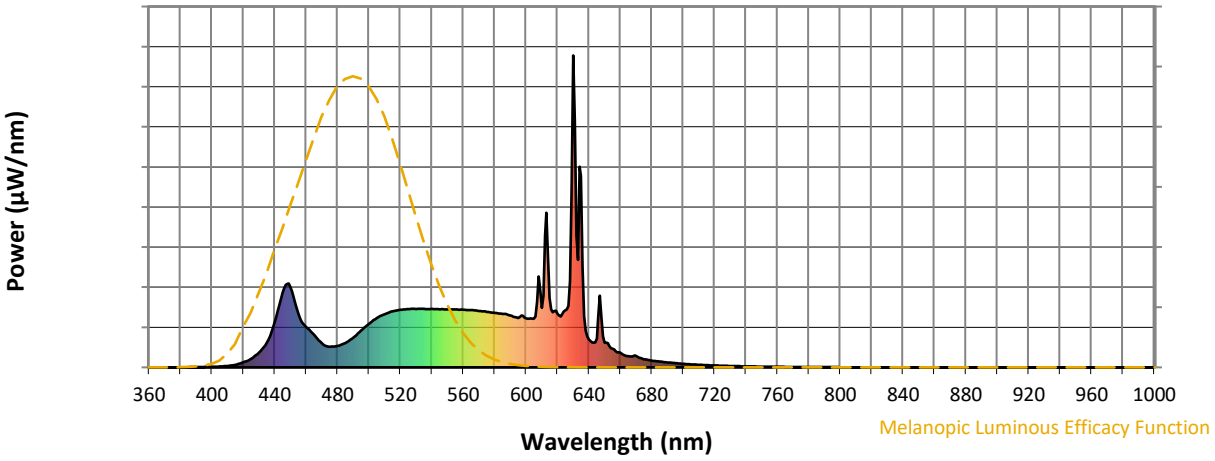
Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 3.75**

λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)	λ (nm)	Power W^/nm	Lumens (ϕ/nm)
360	0	NR	490	95	NR	620	171	NR	750	2	NR	880	0	NR
365	0	NR	495	118	NR	625	183	NR	755	2	NR	885	0	NR
370	0	NR	500	140	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	158	NR	635	614	NR	765	2	NR	895	0	NR
380	0	NR	510	171	NR	640	89	NR	770	1	NR	900	0	NR
385	0	NR	515	180	NR	645	93	NR	775	1	NR	905	0	NR
390	1	NR	520	185	NR	650	79	NR	780	1	NR	910	0	NR
395	1	NR	525	186	NR	655	59	NR	785	1	NR	915	0	NR
400	2	NR	530	187	NR	660	47	NR	790	1	NR	920	0	NR
405	3	NR	535	187	NR	665	35	NR	795	1	NR	925	0	NR
410	4	NR	540	187	NR	670	37	NR	800	1	NR	930	0	NR
415	9	NR	545	186	NR	675	26	NR	805	1	NR	935	0	NR
420	16	NR	550	186	NR	680	22	NR	810	0	NR	940	0	NR
425	28	NR	555	186	NR	685	19	NR	815	0	NR	945	0	NR
430	47	NR	560	185	NR	690	16	NR	820	0	NR	950	0	NR
435	80	NR	565	184	NR	695	14	NR	825	0	NR	955	0	NR
440	144	NR	570	181	NR	700	11	NR	830	0	NR	960	0	NR
445	240	NR	575	177	NR	705	10	NR	835	0	NR	965	0	NR
450	258	NR	580	175	NR	710	8	NR	840	0	NR	970	0	NR
455	172	NR	585	172	NR	715	7	NR	845	0	NR	975	0	NR
460	129	NR	590	166	NR	720	6	NR	850	0	NR	980	0	NR
465	105	NR	595	159	NR	725	5	NR	855	0	NR	985	0	NR
470	77	NR	600	157	NR	730	4	NR	860	0	NR	990	0	NR
475	66	NR	605	156	NR	735	4	NR	865	0	NR	995	0	NR
480	69	NR	610	191	NR	740	3	NR	870	0	NR	1000	0	NR
485	78	NR	615	222	NR	745	3	NR	875	0	NR			

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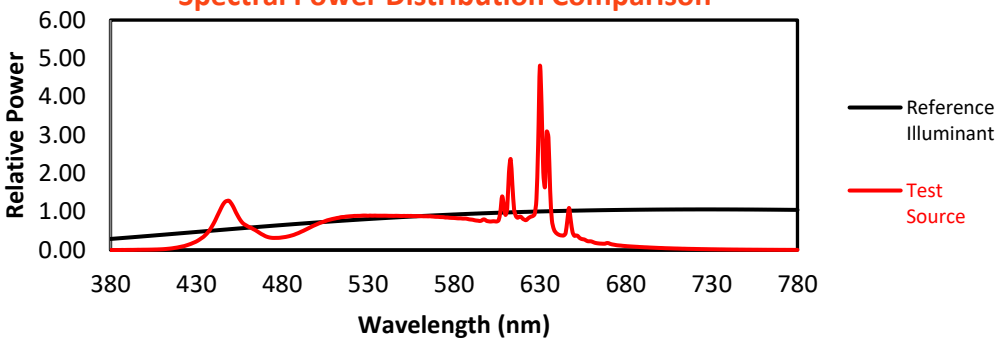
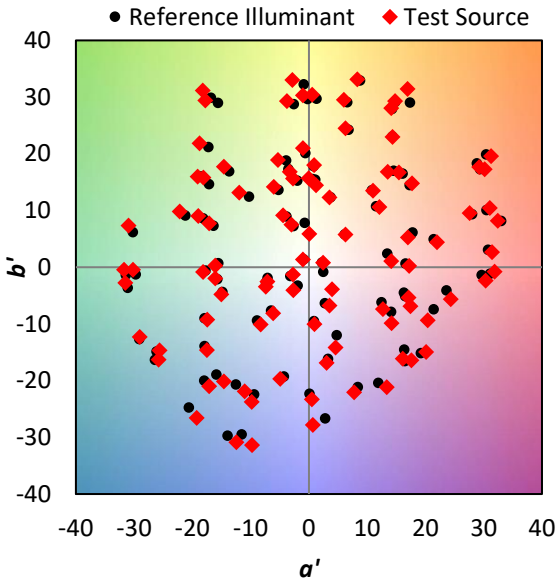
Summary

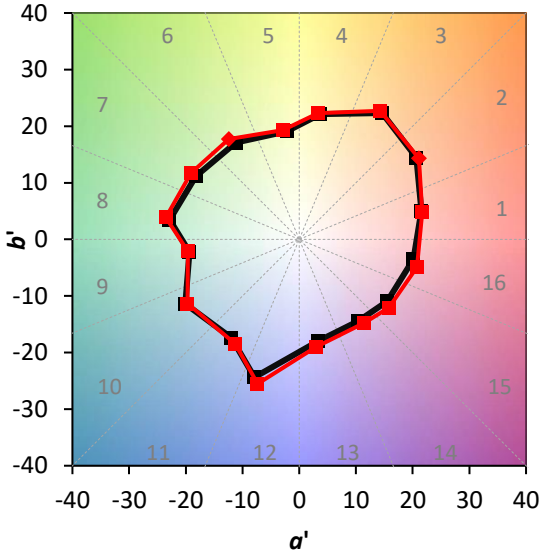
R_f = 92.8
R_g = 105.2
CIE R_a = 93.9
R_9 = 90.3

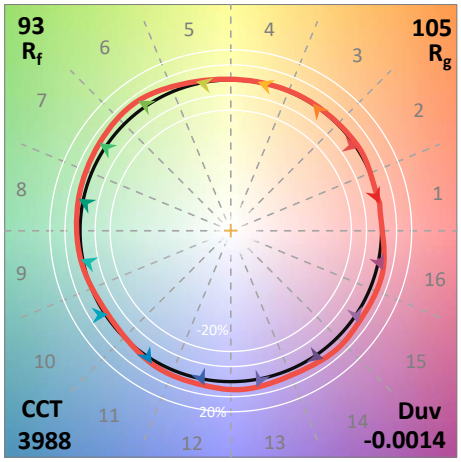
Spectral Power Distribution Comparison

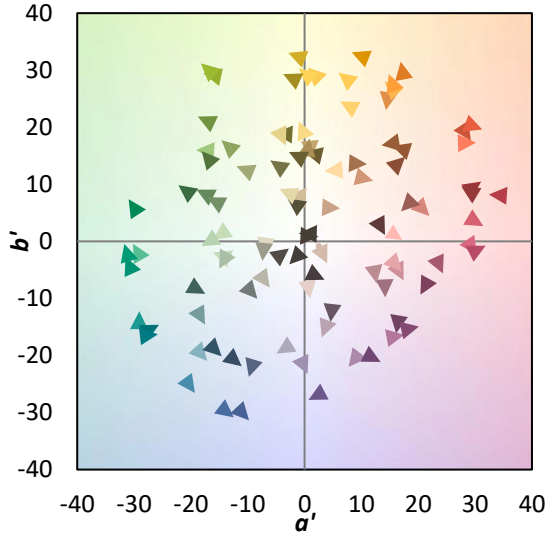


Color Vector Graphics









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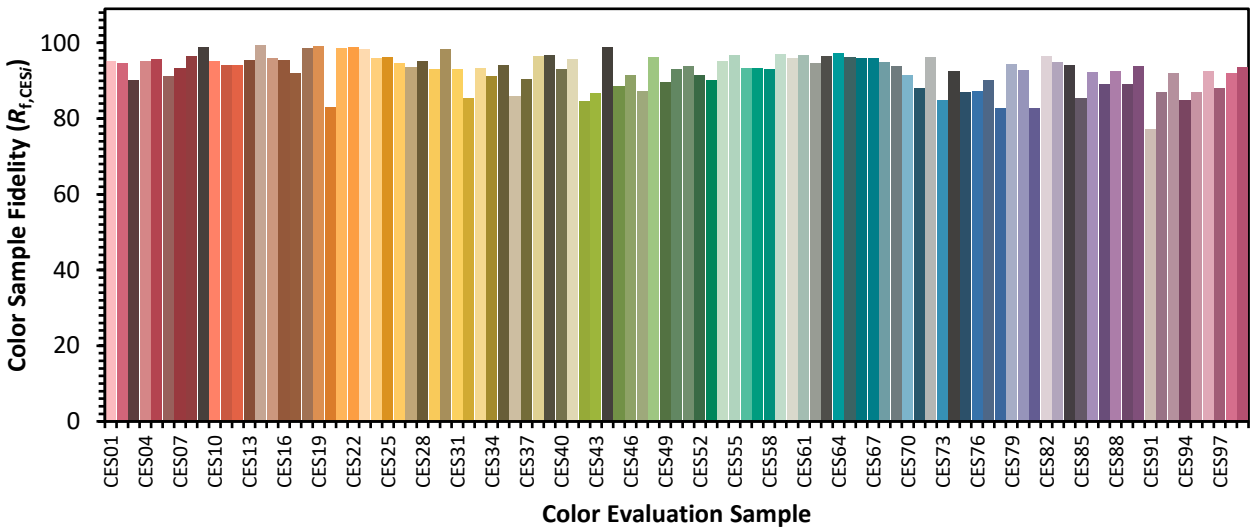
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 95	CES51 = 94	CES76 = 87
CES02 = 62	CES27 = 94	CES52 = 91	CES77 = 90
CES03 = 32	CES28 = 95	CES53 = 90	CES78 = 83
CES04 = 69	CES29 = 93	CES54 = 95	CES79 = 94
CES05 = 49	CES30 = 98	CES55 = 97	CES80 = 93
CES06 = 50	CES31 = 93	CES56 = 93	CES81 = 83
CES07 = 43	CES32 = 85	CES57 = 93	CES82 = 96
CES08 = 42	CES33 = 93	CES58 = 93	CES83 = 95
CES09 = 29	CES34 = 91	CES59 = 97	CES84 = 94
CES10 = 74	CES35 = 94	CES60 = 96	CES85 = 85
CES11 = 57	CES36 = 86	CES61 = 97	CES86 = 92
CES12 = 63	CES37 = 91	CES62 = 95	CES87 = 89
CES13 = 43	CES38 = 96	CES63 = 96	CES88 = 93
CES14 = 74	CES39 = 97	CES64 = 97	CES89 = 89
CES15 = 71	CES40 = 93	CES65 = 96	CES90 = 94
CES16 = 47	CES41 = 96	CES66 = 96	CES91 = 77
CES17 = 49	CES42 = 85	CES67 = 96	CES92 = 87
CES18 = 56	CES43 = 87	CES68 = 95	CES93 = 92
CES19 = 70	CES44 = 99	CES69 = 94	CES94 = 85
CES20 = 66	CES45 = 89	CES70 = 92	CES95 = 87
CES21 = 85	CES46 = 92	CES71 = 88	CES96 = 93
CES22 = 77	CES47 = 87	CES72 = 96	CES97 = 88
CES23 = 91	CES48 = 96	CES73 = 85	CES98 = 92
CES24 = 90	CES49 = 90	CES74 = 92	CES99 = 94
CES25 = 71	CES50 = 93	CES75 = 87	



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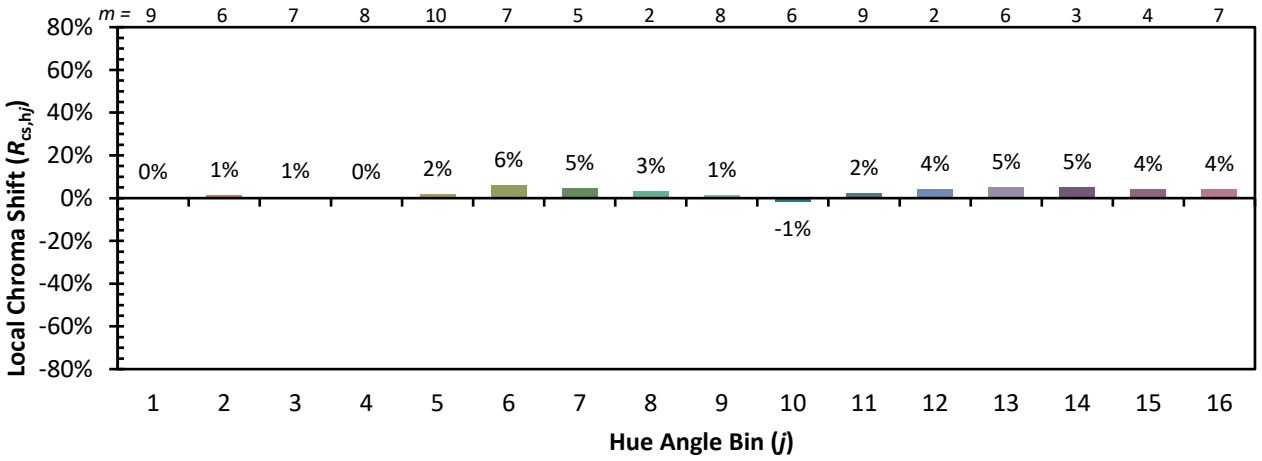
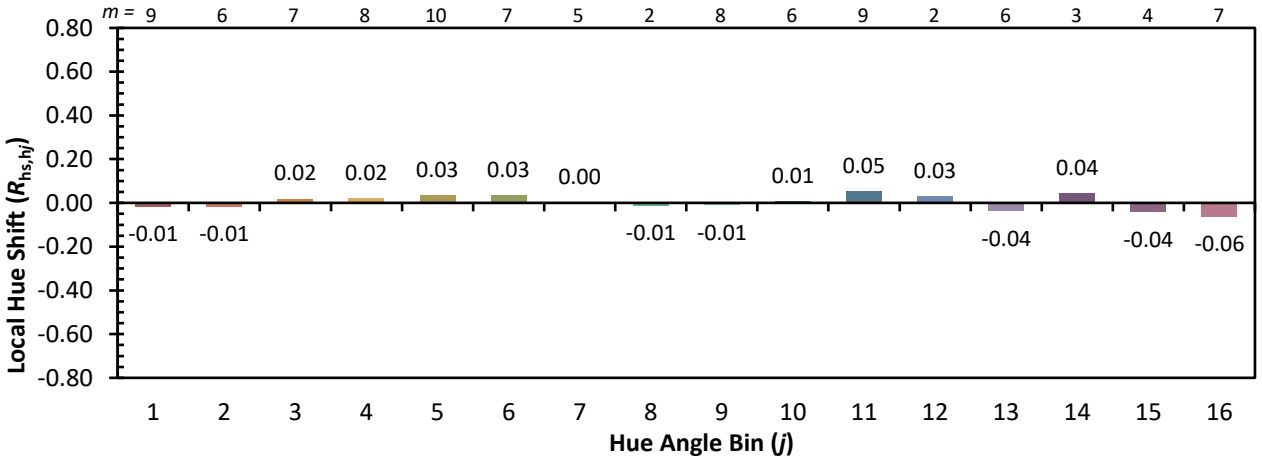
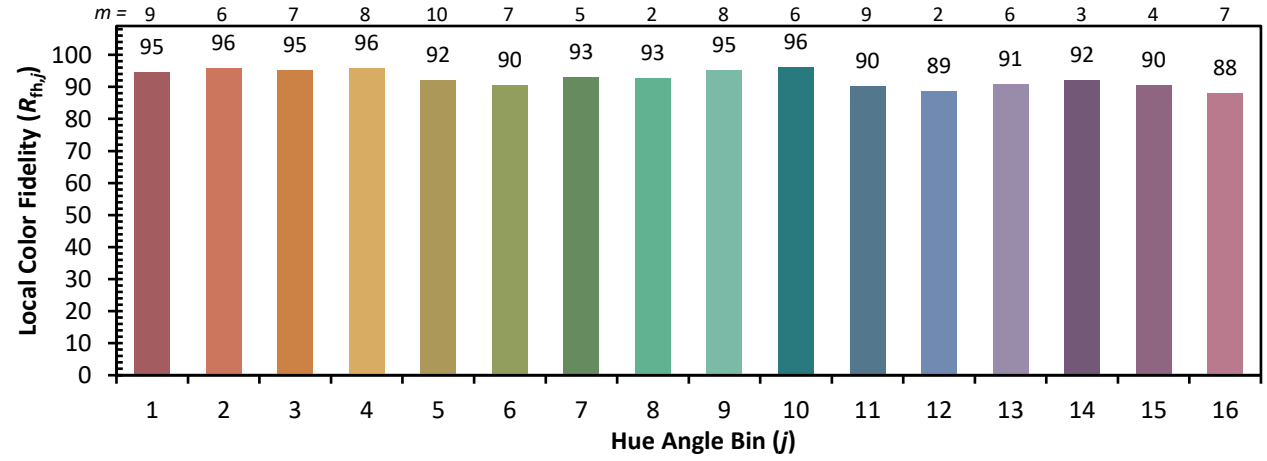
Color Rendition by Hue-Angle Bin







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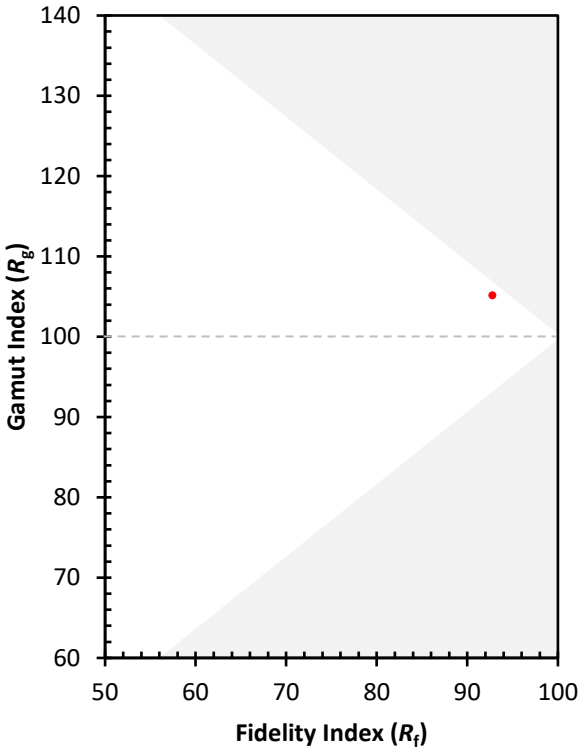
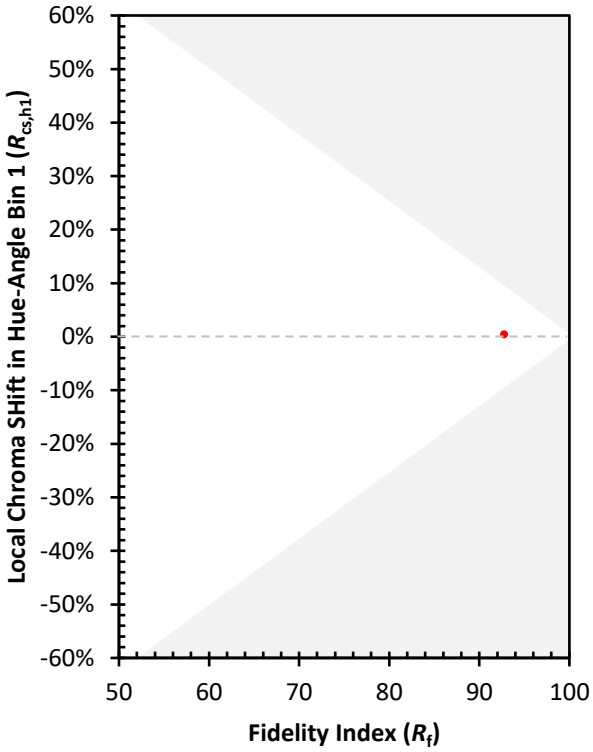
Measure Comparisons





(END OF REPORT)