

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: P1046646

Luminaire Tested: FMNL1515FS5-(black trim)-950

Issue Date: 07/03/2025

Tested By:

Approved By:



NVLAP Lab Code: 200050-0

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Test Information

Test Method: LM-79-2019
Report Number: P1046646
Test Lab: Cooper lighting solutions
Issue Date: 07/03/2025
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: FMNL1515FS5-(black trim)-950
Description: HALO 15 inch 90 CRI COLOR SELECTABLE flush mount Black Trim FIXTURE with night light
Light Source: 5000K CCT, 90 CRI LEDS
Ballast/Driver: -

Summary

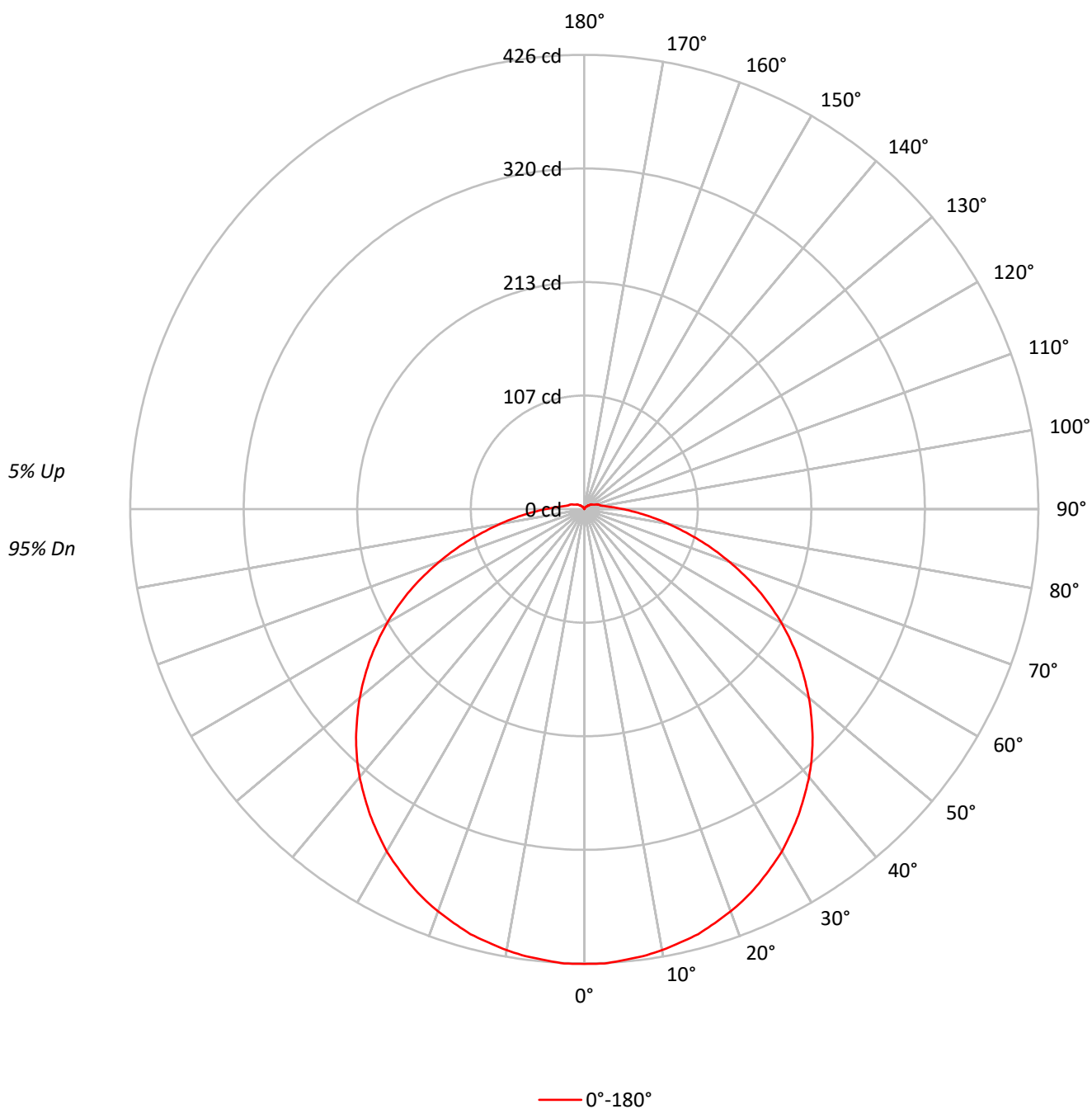
Lumens per Lamp: N/A
Luminaire Lumens: 1430.7 lumens
Efficiency: N/A
Efficacy: 85.2 lumens/watt
Spacing Criteria (0/90/45): 1.29 / 1.29 / 1.42
Luminous Opening: Circular (Dia: 1.2' x H: 0')
CIE Type: Direct

Input Watts (W): 16.8
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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CATALOG NUMBER: FMNL1515FS5-(black trim)-950

Luminous Intensity Polar Plot



CATALOG NUMBER: FMNL1515FS5-(black trim)-950

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	0		
RCR																				
0	118	118	118	118	115	115	115	115	109	109	109	103	103	103	98	98	98	95		
1	106	101	96	92	103	98	94	90	93	90	86	88	85	83	84	82	80	77		
2	96	87	80	74	93	85	78	72	81	75	70	77	72	68	73	69	66	63		
3	87	76	68	61	84	74	66	60	70	64	58	67	61	56	64	59	55	52		
4	80	67	58	51	77	65	57	50	62	55	49	59	53	48	57	51	47	44		
5	73	60	50	44	71	58	50	43	56	48	42	53	47	41	51	45	40	38		
6	67	54	44	38	65	52	44	37	50	42	37	48	41	36	46	40	35	33		
7	62	49	40	33	60	48	39	33	46	38	32	44	37	32	42	36	31	29		
8	58	44	36	30	56	43	35	29	42	34	29	40	33	28	38	32	28	26		
9	54	41	32	26	53	40	32	26	38	31	26	37	30	26	35	30	25	23		
10	51	37	29	24	49	37	29	24	35	28	23	34	28	23	33	27	23	21		

	0°
0°	4059
5°	4057
10°	4059
15°	4065
20°	4065
25°	4069
30°	4074
35°	4070
40°	4075
45°	4077
50°	4072
55°	4070
60°	4068
65°	4060
70°	4035
75°	4100
80°	4429
85°	5984

Horizontal Angle: 0°
Vertical Angle: 87.5°
Luminance: 9731 cd/sqm

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CATALOG NUMBER: FMNL1515FS5-(black trim)-950

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	40.4	2.8
10°-20°	116.4	8.1
20°-30°	178.7	12.5
30°-40°	219.2	15.3
40°-50°	233.6	16.3
50°-60°	219.1	15.3
60°-70°	178.1	12.4
70°-80°	118.1	8.3
80°-90°	61.3	4.3
90°-100°	27.6	1.9
100°-110°	15.9	1.1
110°-120°	10.3	0.7
120°-130°	6.6	0.5
130°-140°	3.4	0.2
140°-150°	1.6	0.1
150°-160°	0.4	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	335.5	23.4
0°-40°	554.7	38.8
0°-60°	1007.4	70.4
0°-90°	1364.8	95.4
90°-120°	53.8	3.8
90°-150°	65.5	4.6
90°-180°	66.0	4.6
0°-180°	1430.7	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	426	
5°	425	40
15°	413	116
25°	388	179
35°	350	219
45°	303	234
55°	245	219
65°	180	178
75°	112	118
85°	55	50
90°	36	20
95°	24	19
105°	15	16
115°	10	10
125°	7	7
135°	5	3
145°	3	2
155°	1	0
165°	0	0
175°	0	0
180°	0	

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CANDELA DISTRIBUTION (FULL):

0°	
0°	426.5
2.5°	426.5
5°	424.6
7.5°	422.8
10°	420.0
12.5°	416.3
15°	412.6
17.5°	407.0
20°	401.4
22.5°	394.9
25°	387.5
27.5°	379.1
30°	370.7
32.5°	360.5
35°	350.3
37.5°	339.1
40°	328.0
42.5°	315.9
45°	302.9
47.5°	289.0
50°	275.0
52.5°	260.2
55°	245.3
57.5°	229.5
60°	213.7
62.5°	197.0
65°	180.3
67.5°	162.6
70°	145.0
72.5°	128.2
75°	111.5
77.5°	94.8
80°	80.8
82.5°	66.9
85°	54.8
87.5°	44.6
90°	36.2
92.5°	29.7
95°	24.2
97.5°	20.4
100°	17.7
102.5°	15.8
105°	14.9
107.5°	13.9
110°	13.0

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CANDELA DISTRIBUTION (continued):

	0°
112.5°	11.2
115°	10.2
117.5°	9.3
120°	8.4
122.5°	8.4
125°	7.4
127.5°	6.5
130°	5.6
132.5°	4.6
135°	4.6
137.5°	3.7
140°	3.7
142.5°	2.8
145°	2.8
147.5°	1.9
150°	1.9
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	16.7	18.3	17.2	18.7	19.1	16.7	18.3	17.2	18.7	19.1
	3H	18.8	20.2	19.2	20.6	21.1	18.8	20.2	19.2	20.6	21.1
	4H	19.7	21.0	20.1	21.5	21.9	19.7	21.0	20.1	21.5	21.9
	6H	20.4	21.7	20.9	22.2	22.7	20.4	21.7	20.9	22.2	22.7
	8H	20.8	22.0	21.3	22.5	23.0	20.8	22.0	21.3	22.5	23.0
	12H	21.2	22.4	21.7	22.8	23.4	21.2	22.4	21.7	22.8	23.4
4H	2H	17.4	18.8	17.9	19.2	19.7	17.4	18.8	17.9	19.2	19.7
	3H	19.7	20.9	20.2	21.4	21.9	19.7	20.9	20.2	21.4	21.9
	4H	20.7	21.8	21.2	22.3	22.8	20.7	21.8	21.2	22.3	22.8
	6H	21.7	22.6	22.2	23.2	23.7	21.7	22.6	22.2	23.2	23.7
	8H	22.2	23.0	22.7	23.6	24.1	22.2	23.0	22.7	23.6	24.1
	12H	22.6	23.4	23.2	24.0	24.5	22.6	23.4	23.2	24.0	24.5
8H	4H	21.2	22.0	21.7	22.6	23.1	21.2	22.0	21.7	22.6	23.1
	6H	22.3	23.1	22.9	23.6	24.2	22.3	23.1	22.9	23.6	24.2
	8H	22.9	23.6	23.5	24.1	24.7	22.9	23.6	23.5	24.1	24.7
	12H	23.5	24.1	24.1	24.7	25.4	23.5	24.1	24.1	24.7	25.4
12H	4H	21.2	22.0	21.8	22.6	23.2	21.2	22.0	21.8	22.6	23.2
	6H	22.5	23.1	23.0	23.7	24.3	22.5	23.1	23.0	23.7	24.3
	8H	23.1	23.7	23.7	24.3	24.9	23.1	23.7	23.7	24.3	24.9

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

Report Prepared for

Cooper Lighting Solutions

Halo Home

Report Number: SP1-2506-468-17

Test Date: 07/09/2025

Luminaire Tested: FMNL1515FS5-5000K

Data in this report applies to families of products including FMNL1515FS5-5000K

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

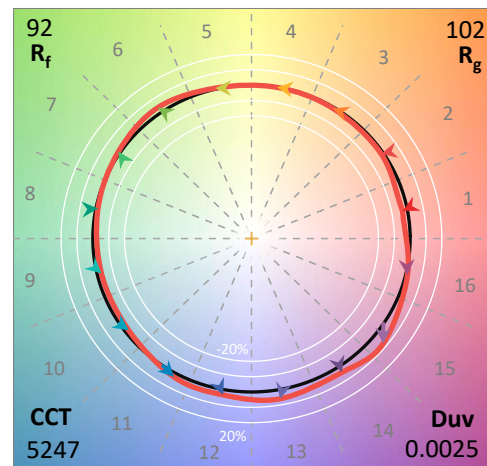
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2506-468-17
 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: **FMNL1515FS5-5000K**
 Description: HALO FLUSH MOUNT NIGHT LIGHT 15 INCH

Spectral Parameters

CCT (K): 5247
 CIE u' : 0.2072
 CIE v' : 0.4837
 Duv: 0.0025
 CIE x: 0.3388
 CIE y: 0.3514
 CIE z: 0.3098
 Peak Wavelength (nm): 630
 Dominant Wavelength (nm): 565
 Purity: 7.10182
 R_f: 91.8
 R_g: 101.9

CRI (Ra): 94.5
 R1: 97.3
 R2: 94.6
 R3: 90.4
 R4: 94.4
 R5: 96.0
 R6: 92.1
 R7: 95.5
 R8: 95.6
 R9: 84.6
 R10: 85.5
 R11: 92.9
 R12: 73.9
 R13: 96.3
 R14: 94.0
 R15: 96.7



Test Conditions

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

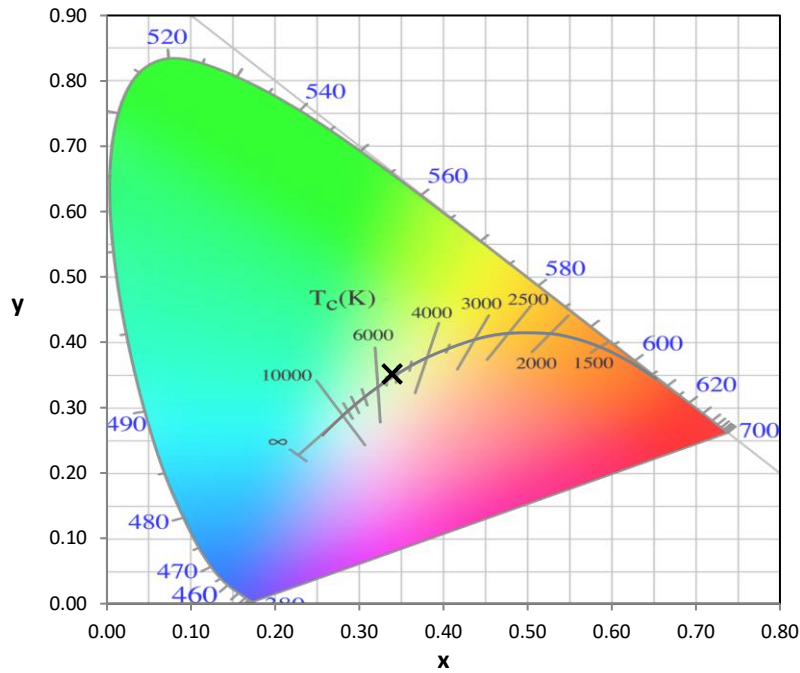
REPORT NUMBER: SP1-2506-468-17

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

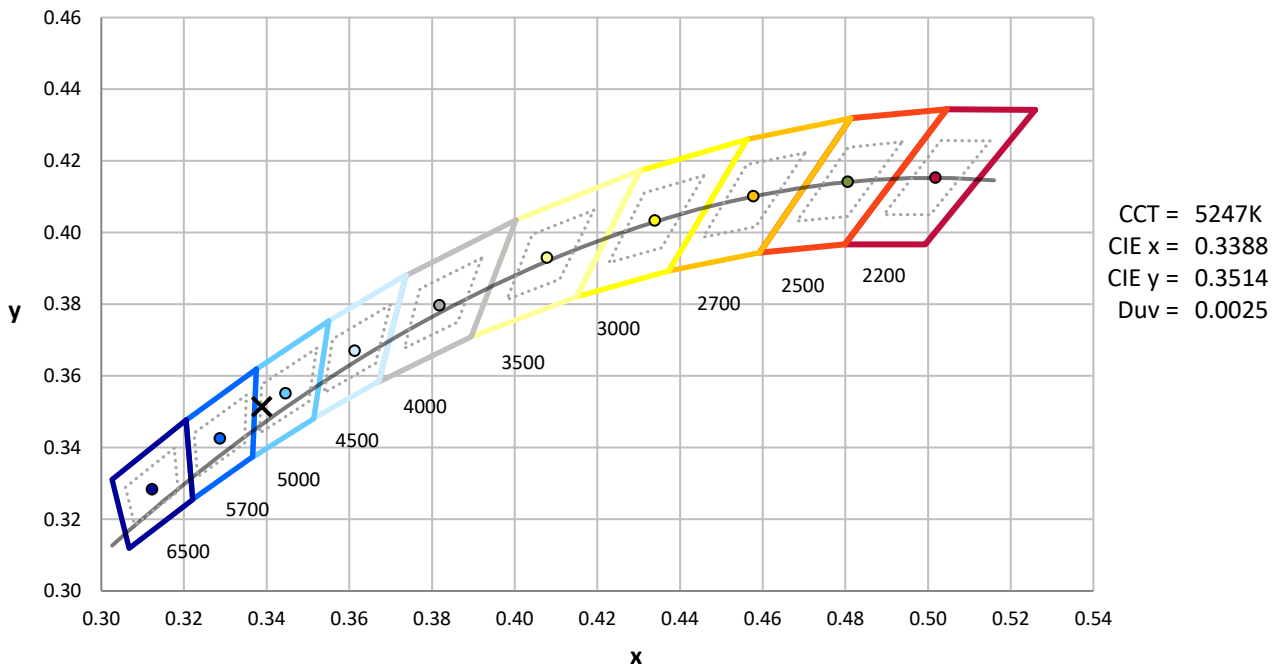
Sample Number	Condition	Description
P2506-468-LM.3	Good	HALO FLUSH MOUNT NIGHT LIGHT 15 INCH

REPORT NUMBER: SP1-2506-468-17

CIE 1931 Chromaticity Diagram



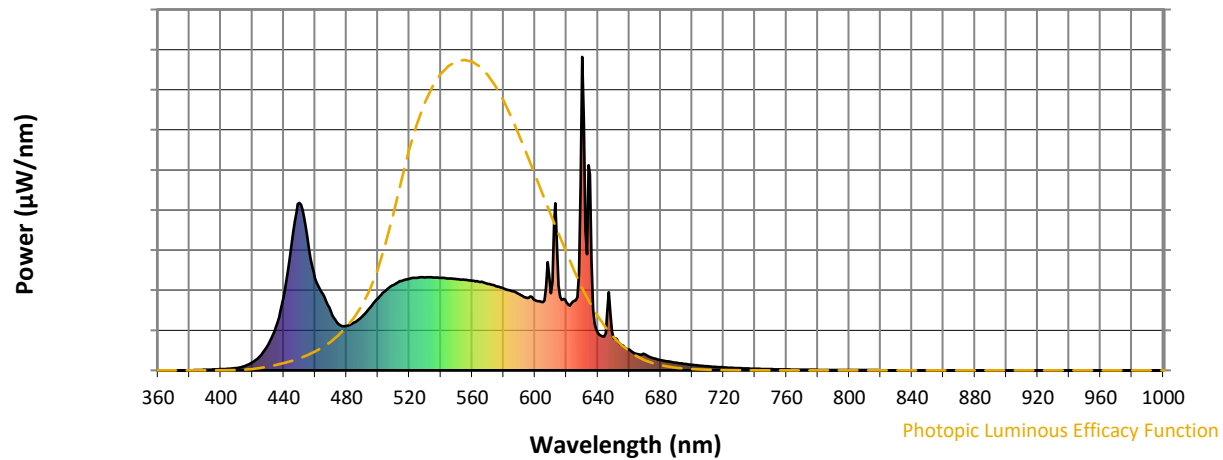
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 4-step quadrangle

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Photopic Flux vs. Wavelength

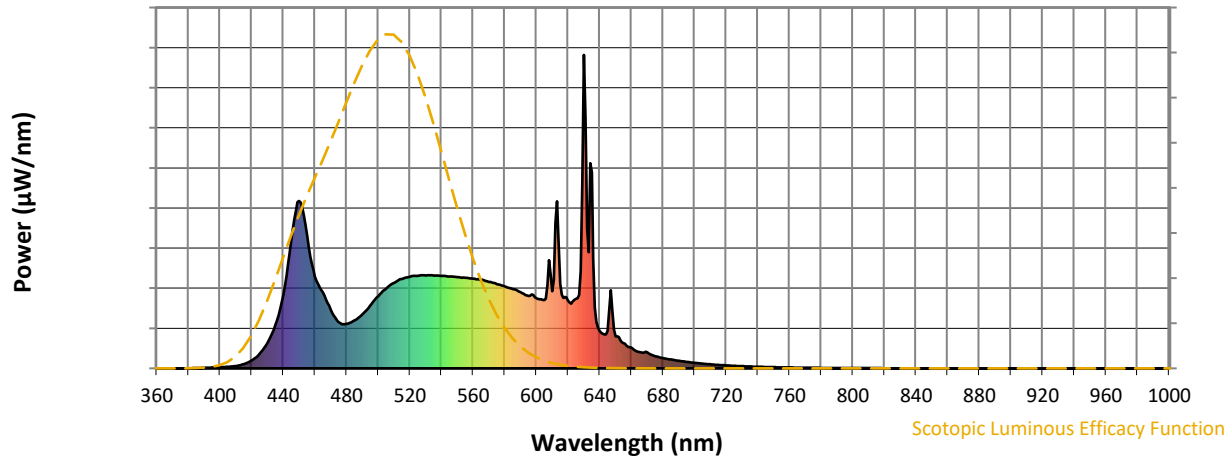


Photopic Lumens: NR

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	172	NR	620	216	NR	750	4	NR	880	0	NR
365	0	NR	495	200	NR	625	222	NR	755	3	NR	885	0	NR
370	0	NR	500	230	NR	630	1000	NR	760	3	NR	890	0	NR
375	0	NR	505	255	NR	635	624	NR	765	2	NR	895	0	NR
380	0	NR	510	273	NR	640	120	NR	770	2	NR	900	0	NR
385	1	NR	515	285	NR	645	120	NR	775	2	NR	905	0	NR
390	2	NR	520	292	NR	650	102	NR	780	2	NR	910	0	NR
395	3	NR	525	295	NR	655	81	NR	785	1	NR	915	0	NR
400	4	NR	530	296	NR	660	66	NR	790	1	NR	920	0	NR
405	5	NR	535	296	NR	665	52	NR	795	1	NR	925	0	NR
410	8	NR	540	295	NR	670	52	NR	800	1	NR	930	0	NR
415	14	NR	545	293	NR	675	39	NR	805	1	NR	935	0	NR
420	25	NR	550	291	NR	680	33	NR	810	1	NR	940	0	NR
425	46	NR	555	289	NR	685	28	NR	815	1	NR	945	0	NR
430	81	NR	560	286	NR	690	24	NR	820	1	NR	950	0	NR
435	139	NR	565	282	NR	695	21	NR	825	0	NR	955	0	NR
440	235	NR	570	276	NR	700	18	NR	830	0	NR	960	0	NR
445	404	NR	575	269	NR	705	15	NR	835	0	NR	965	0	NR
450	534	NR	580	262	NR	710	13	NR	840	0	NR	970	0	NR
455	425	NR	585	253	NR	715	11	NR	845	0	NR	975	0	NR
460	293	NR	590	243	NR	720	9	NR	850	0	NR	980	0	NR
465	243	NR	595	231	NR	725	8	NR	855	0	NR	985	0	NR
470	187	NR	600	223	NR	730	7	NR	860	0	NR	990	0	NR
475	147	NR	605	217	NR	735	6	NR	865	0	NR	995	0	NR
480	142	NR	610	246	NR	740	5	NR	870	0	NR	1000	0	NR
485	153	NR	615	270	NR	745	4	NR	875	0	NR			

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Scotopic Flux vs. Wavelength



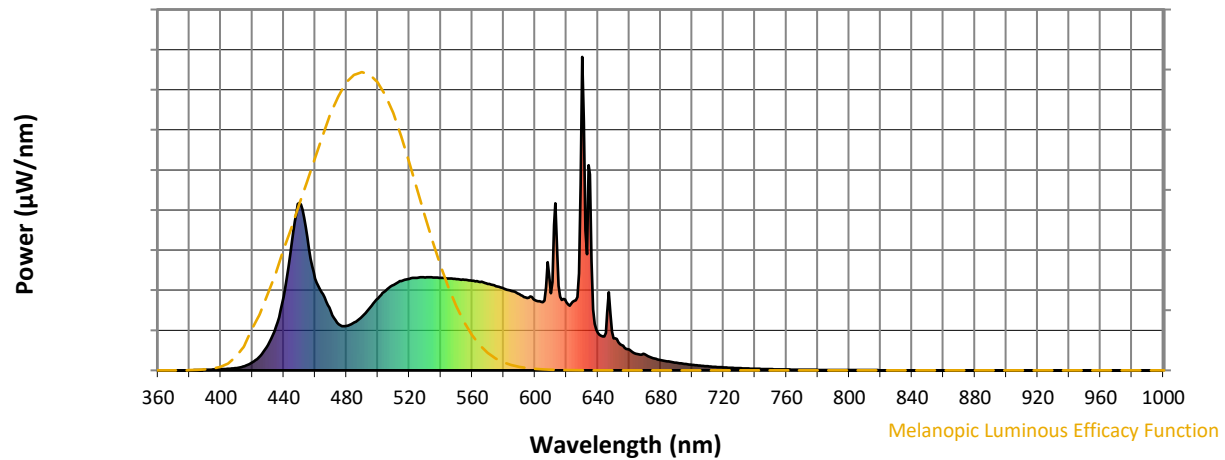
Scotopic Lumens: NR

S/P: 2.11

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	172	NR	620	216	NR	750	4	NR	880	0	NR
365	0	NR	495	200	NR	625	222	NR	755	3	NR	885	0	NR
370	0	NR	500	230	NR	630	1000	NR	760	3	NR	890	0	NR
375	0	NR	505	255	NR	635	624	NR	765	2	NR	895	0	NR
380	0	NR	510	273	NR	640	120	NR	770	2	NR	900	0	NR
385	1	NR	515	285	NR	645	120	NR	775	2	NR	905	0	NR
390	2	NR	520	292	NR	650	102	NR	780	2	NR	910	0	NR
395	3	NR	525	295	NR	655	81	NR	785	1	NR	915	0	NR
400	4	NR	530	296	NR	660	66	NR	790	1	NR	920	0	NR
405	5	NR	535	296	NR	665	52	NR	795	1	NR	925	0	NR
410	8	NR	540	295	NR	670	52	NR	800	1	NR	930	0	NR
415	14	NR	545	293	NR	675	39	NR	805	1	NR	935	0	NR
420	25	NR	550	291	NR	680	33	NR	810	1	NR	940	0	NR
425	46	NR	555	289	NR	685	28	NR	815	1	NR	945	0	NR
430	81	NR	560	286	NR	690	24	NR	820	1	NR	950	0	NR
435	139	NR	565	282	NR	695	21	NR	825	0	NR	955	0	NR
440	235	NR	570	276	NR	700	18	NR	830	0	NR	960	0	NR
445	404	NR	575	269	NR	705	15	NR	835	0	NR	965	0	NR
450	534	NR	580	262	NR	710	13	NR	840	0	NR	970	0	NR
455	425	NR	585	253	NR	715	11	NR	845	0	NR	975	0	NR
460	293	NR	590	243	NR	720	9	NR	850	0	NR	980	0	NR
465	243	NR	595	231	NR	725	8	NR	855	0	NR	985	0	NR
470	187	NR	600	223	NR	730	7	NR	860	0	NR	990	0	NR
475	147	NR	605	217	NR	735	6	NR	865	0	NR	995	0	NR
480	142	NR	610	246	NR	740	5	NR	870	0	NR	1000	0	NR
485	153	NR	615	270	NR	745	4	NR	875	0	NR			

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Melanopic Flux vs. Wavelength


Melanopic Lumens: NR
M/P: 4.54

λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)
360	0	NR	490	172	NR	620	216	NR	750	4	NR	880	0	NR
365	0	NR	495	200	NR	625	222	NR	755	3	NR	885	0	NR
370	0	NR	500	230	NR	630	1000	NR	760	3	NR	890	0	NR
375	0	NR	505	255	NR	635	624	NR	765	2	NR	895	0	NR
380	0	NR	510	273	NR	640	120	NR	770	2	NR	900	0	NR
385	1	NR	515	285	NR	645	120	NR	775	2	NR	905	0	NR
390	2	NR	520	292	NR	650	102	NR	780	2	NR	910	0	NR
395	3	NR	525	295	NR	655	81	NR	785	1	NR	915	0	NR
400	4	NR	530	296	NR	660	66	NR	790	1	NR	920	0	NR
405	5	NR	535	296	NR	665	52	NR	795	1	NR	925	0	NR
410	8	NR	540	295	NR	670	52	NR	800	1	NR	930	0	NR
415	14	NR	545	293	NR	675	39	NR	805	1	NR	935	0	NR
420	25	NR	550	291	NR	680	33	NR	810	1	NR	940	0	NR
425	46	NR	555	289	NR	685	28	NR	815	1	NR	945	0	NR
430	81	NR	560	286	NR	690	24	NR	820	1	NR	950	0	NR
435	139	NR	565	282	NR	695	21	NR	825	0	NR	955	0	NR
440	235	NR	570	276	NR	700	18	NR	830	0	NR	960	0	NR
445	404	NR	575	269	NR	705	15	NR	835	0	NR	965	0	NR
450	534	NR	580	262	NR	710	13	NR	840	0	NR	970	0	NR
455	425	NR	585	253	NR	715	11	NR	845	0	NR	975	0	NR
460	293	NR	590	243	NR	720	9	NR	850	0	NR	980	0	NR
465	243	NR	595	231	NR	725	8	NR	855	0	NR	985	0	NR
470	187	NR	600	223	NR	730	7	NR	860	0	NR	990	0	NR
475	147	NR	605	217	NR	735	6	NR	865	0	NR	995	0	NR
480	142	NR	610	246	NR	740	5	NR	870	0	NR	1000	0	NR
485	153	NR	615	270	NR	745	4	NR	875	0	NR			

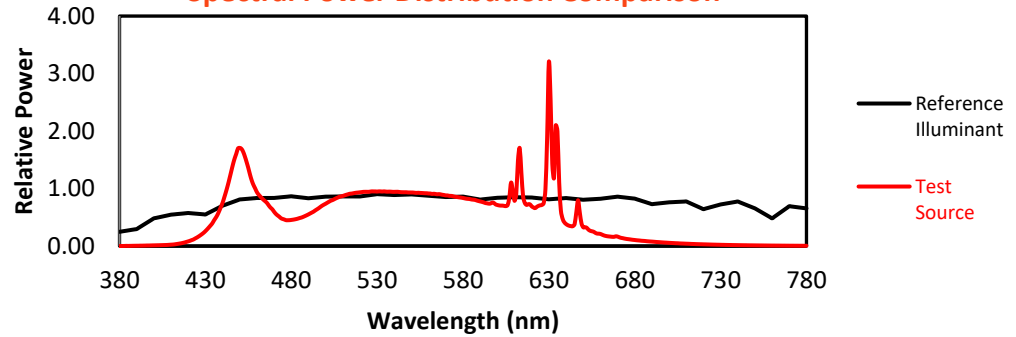
REPORT NUMBER: SP1-2506-468-17

TM-30-18

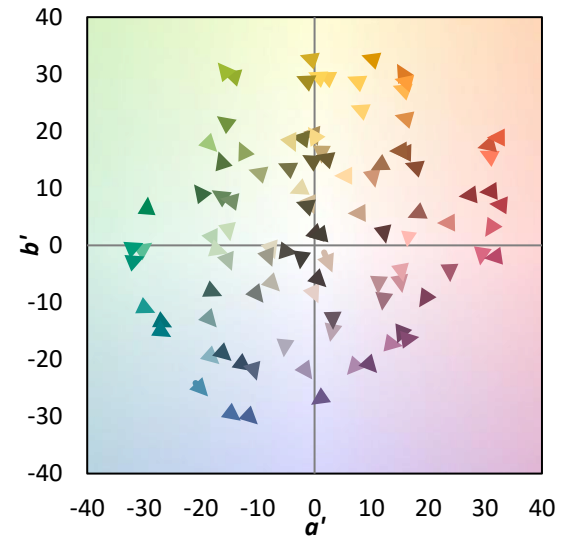
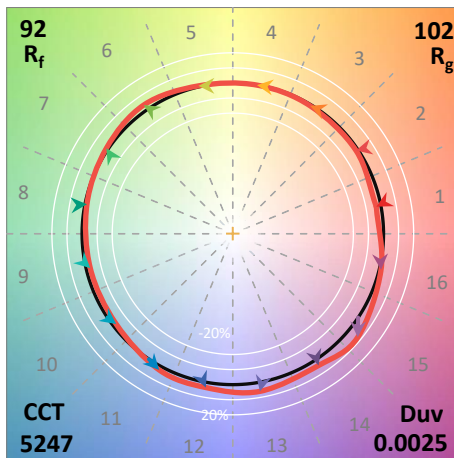
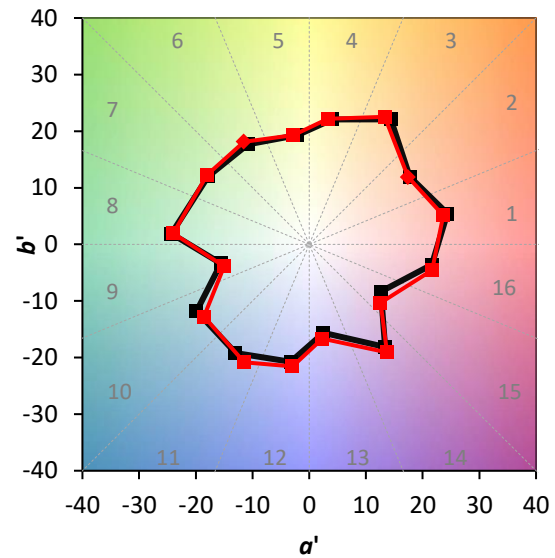
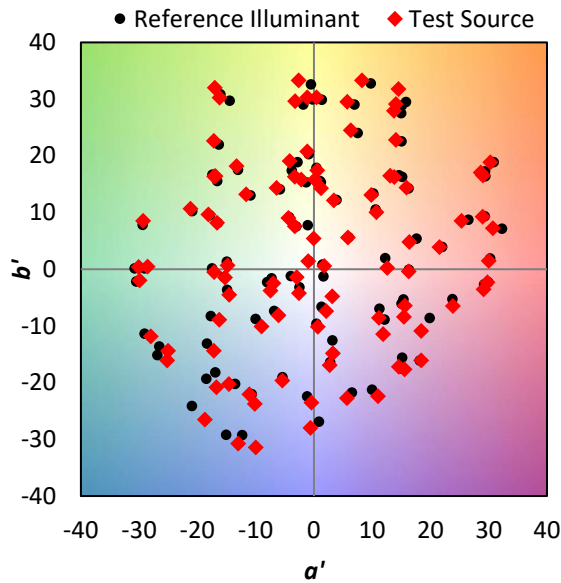
Summary

$R_f = 91.8$
 $R_g = 101.9$
 $CIE R_a = 94.5$
 $R_g = 84.6$

Spectral Power Distribution Comparison

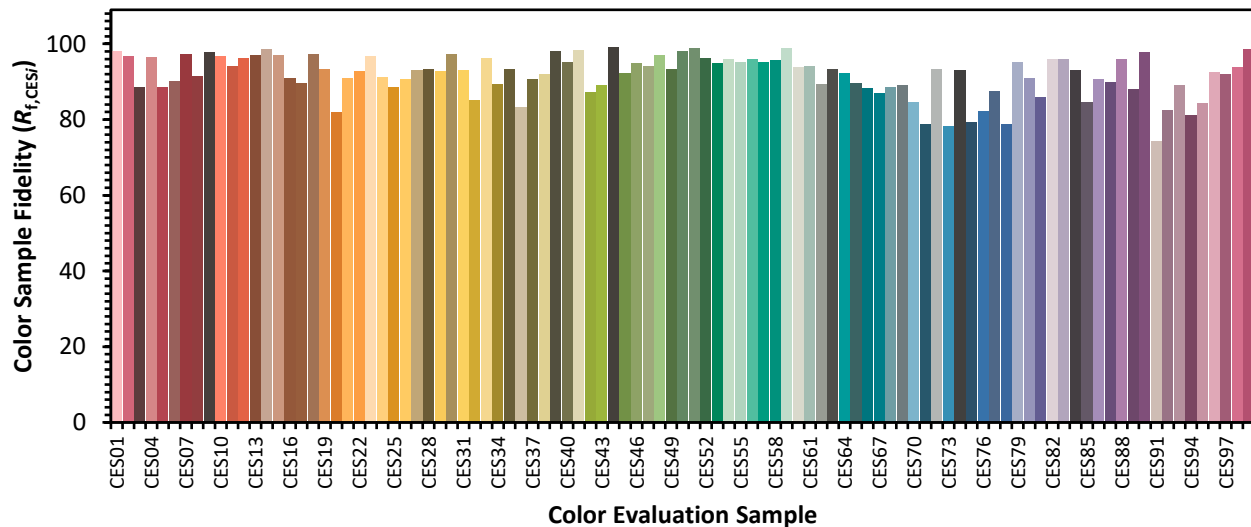


Color Vector Graphics

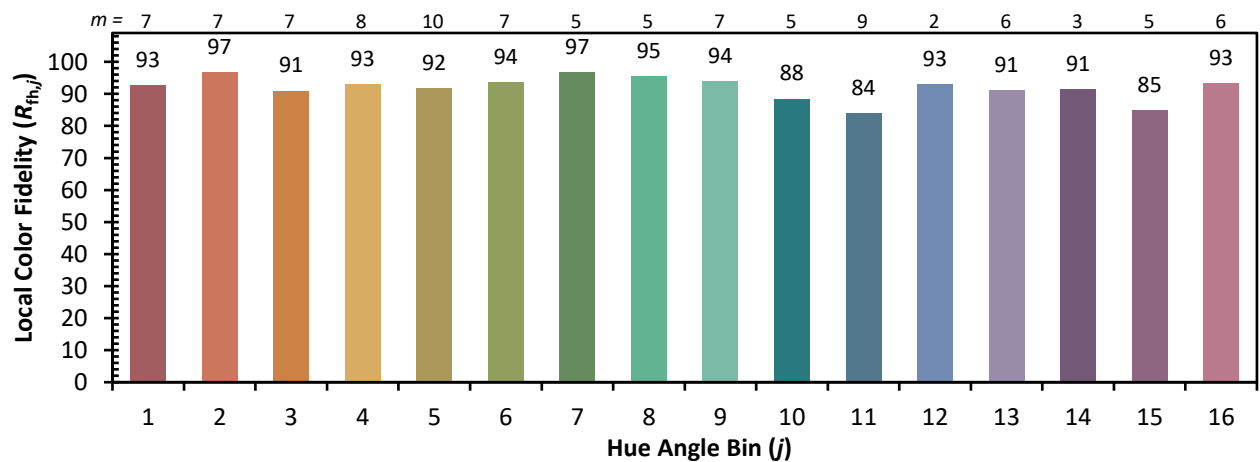
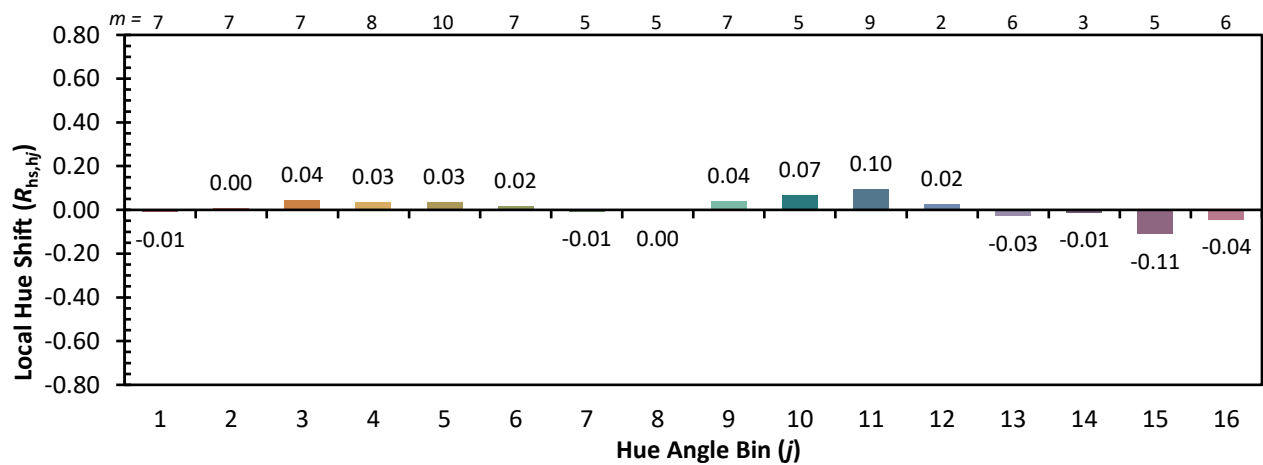
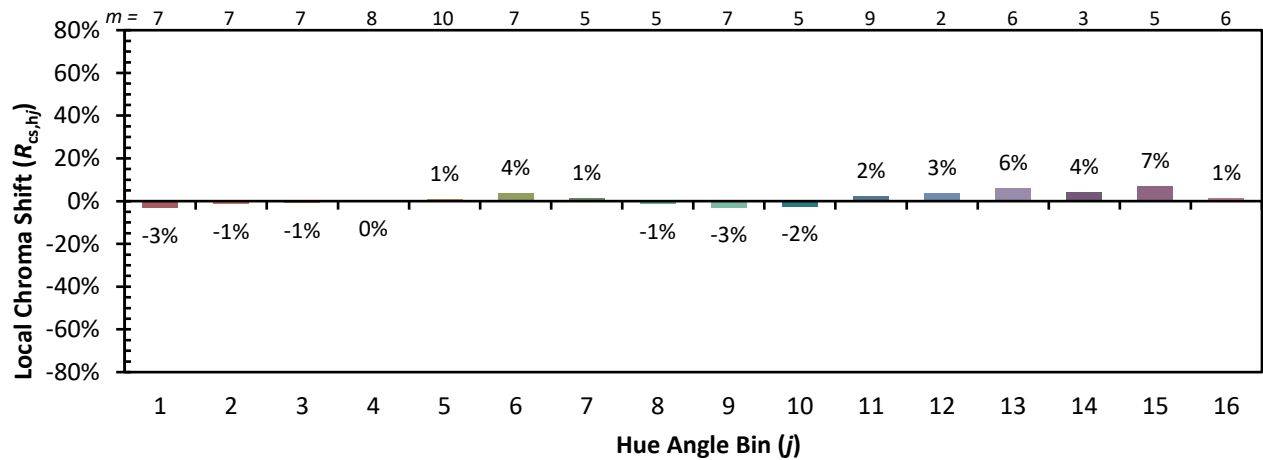


Individual Sample Fidelity Index ($R_{f,i}$)

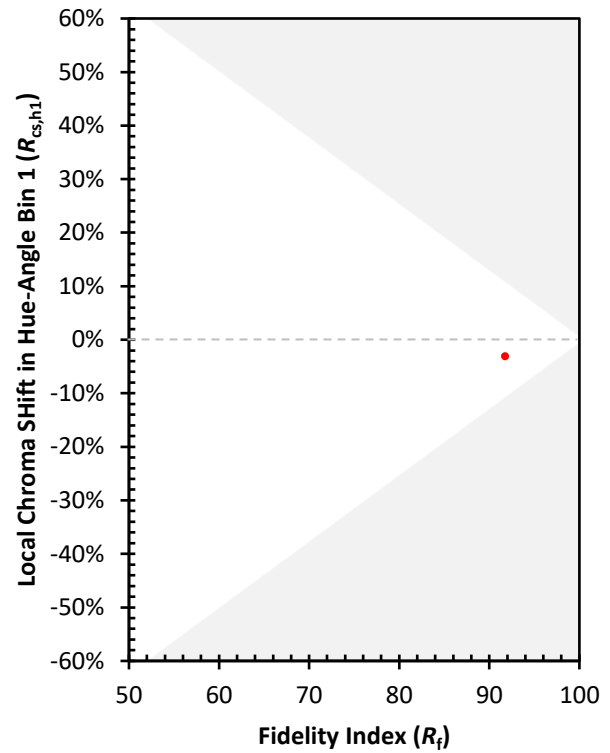
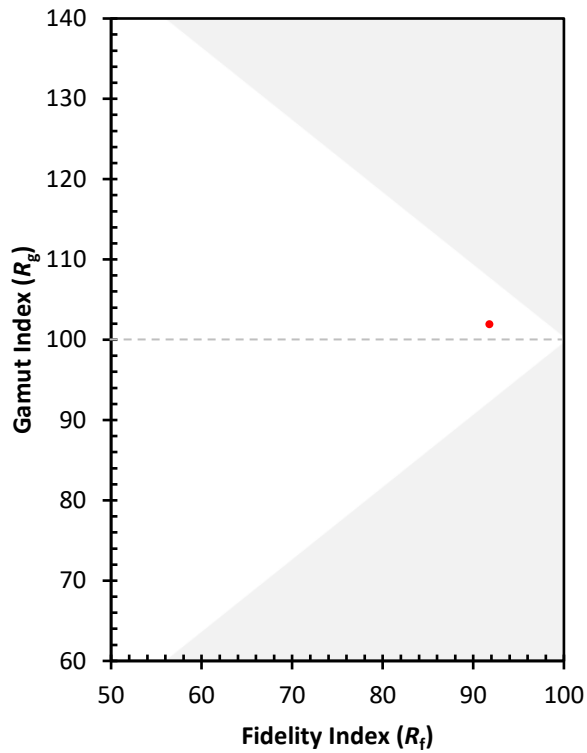
CES01 = 85	CES26 = 91	CES51 = 99	CES76 = 82
CES02 = 60	CES27 = 93	CES52 = 96	CES77 = 87
CES03 = 31	CES28 = 93	CES53 = 95	CES78 = 79
CES04 = 68	CES29 = 93	CES54 = 96	CES79 = 95
CES05 = 48	CES30 = 97	CES55 = 95	CES80 = 91
CES06 = 50	CES31 = 93	CES56 = 96	CES81 = 86
CES07 = 41	CES32 = 85	CES57 = 95	CES82 = 96
CES08 = 40	CES33 = 96	CES58 = 96	CES83 = 96
CES09 = 29	CES34 = 89	CES59 = 99	CES84 = 93
CES10 = 73	CES35 = 93	CES60 = 94	CES85 = 85
CES11 = 55	CES36 = 83	CES61 = 94	CES86 = 91
CES12 = 61	CES37 = 91	CES62 = 89	CES87 = 90
CES13 = 42	CES38 = 92	CES63 = 93	CES88 = 96
CES14 = 74	CES39 = 98	CES64 = 92	CES89 = 88
CES15 = 71	CES40 = 95	CES65 = 90	CES90 = 98
CES16 = 46	CES41 = 98	CES66 = 88	CES91 = 74
CES17 = 48	CES42 = 87	CES67 = 87	CES92 = 83
CES18 = 56	CES43 = 89	CES68 = 88	CES93 = 89
CES19 = 70	CES44 = 99	CES69 = 89	CES94 = 81
CES20 = 65	CES45 = 92	CES70 = 85	CES95 = 84
CES21 = 84	CES46 = 95	CES71 = 79	CES96 = 92
CES22 = 77	CES47 = 94	CES72 = 93	CES97 = 92
CES23 = 91	CES48 = 97	CES73 = 78	CES98 = 94
CES24 = 89	CES49 = 93	CES74 = 93	CES99 = 99
CES25 = 70	CES50 = 98	CES75 = 79	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)