

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: P1046644

Luminaire Tested: FMNL1515FS5-(black trim)-935

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: P1046644
Test Lab: Cooper lighting solutions
Issue Date: 07/03/2025
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: FMNL1515FS5-(black trim)-935
Description: HALO 15 inch 90 CRI COLOR SELECTABLE flush mount Black Trim FIXTURE with night light
Light Source: 3500K CCT, 90 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 1480.8 lumens
Efficiency: N/A
Efficacy: 88.1 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

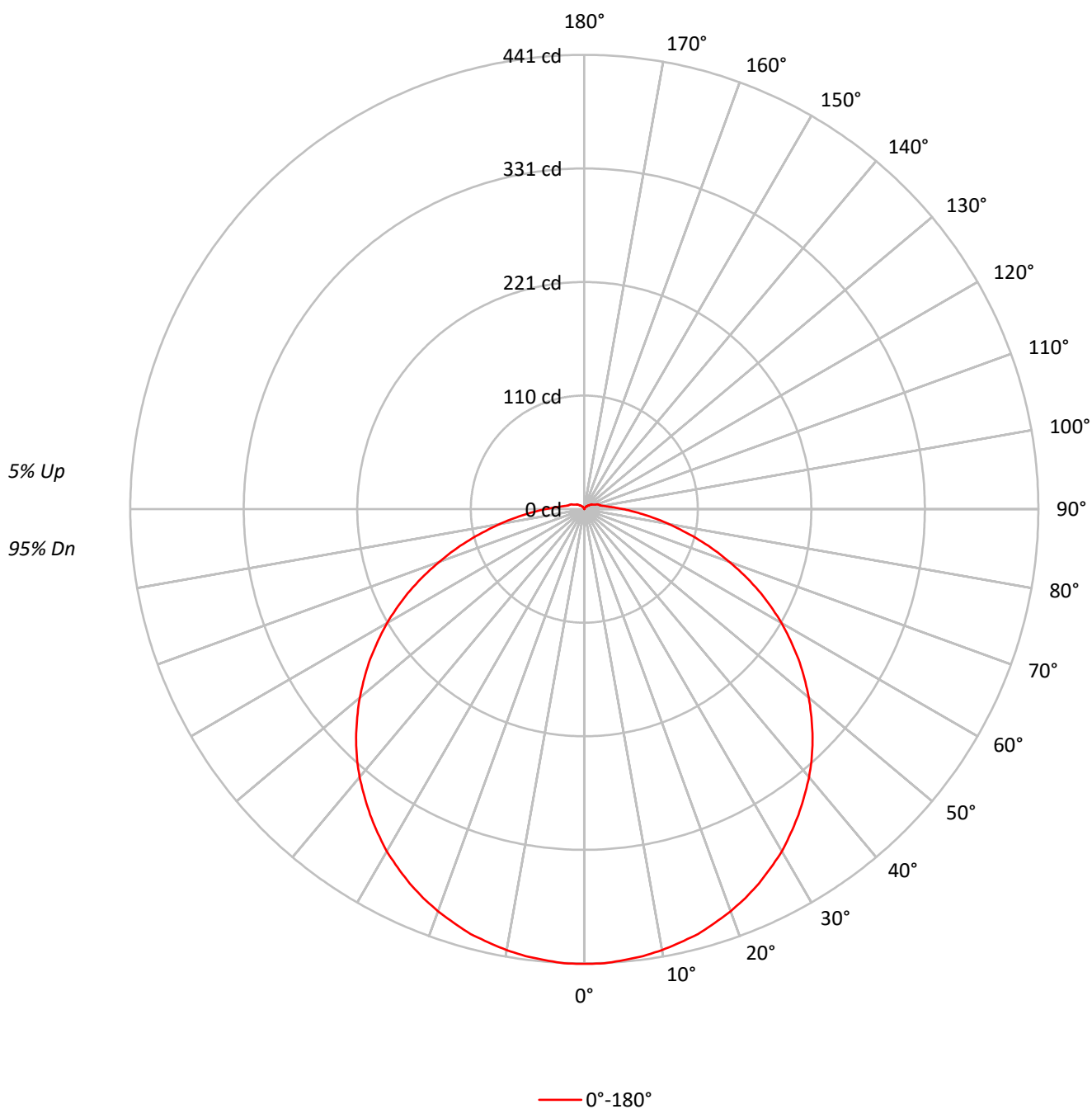
Input Watts (W): 16.8
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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)-935

Luminous Intensity Polar Plot



TEST NUMBER: P1046644

CATALOG NUMBER: FMNL1515FS5-(black trim)-935

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

AVERAGE LUMINANCE (cd/sqm):

	0°
0°	4201
5°	4199
10°	4201
15°	4207
20°	4207
25°	4211
30°	4217
35°	4212
40°	4218
45°	4220
50°	4215
55°	4213
60°	4210
65°	4202
70°	4174
75°	4244
80°	4587
85°	6192

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°

Vertical Angle: 87.5°

Luminance: 10080 cd/sqm

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	41.8	2.8
10°-20°	120.5	8.1
20°-30°	184.9	12.5
30°-40°	226.9	15.3
40°-50°	241.8	16.3
50°-60°	226.8	15.3
60°-70°	184.3	12.4
70°-80°	122.2	8.3
80°-90°	63.4	4.3
90°-100°	28.6	1.9
100°-110°	16.4	1.1
110°-120°	10.6	0.7
120°-130°	6.8	0.5
130°-140°	3.5	0.2
140°-150°	1.7	0.1
150°-160°	0.5	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	347.2	23.4
0°-40°	574.1	38.8
0°-60°	1042.7	70.4
0°-90°	1412.6	95.4
90°-120°	55.7	3.8
90°-150°	67.8	4.6
90°-180°	68.0	4.6
0°-180°	1480.8	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	441	
5°	440	42
15°	427	120
25°	401	185
35°	362	227
45°	314	242
55°	254	227
65°	187	184
75°	115	122
85°	57	52
90°	38	21
95°	25	19
105°	15	16
115°	11	11
125°	8	7
135°	5	4
145°	3	2
155°	1	0
165°	0	0
175°	0	0
180°	0	

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CANDELA DISTRIBUTION (FULL):

0°	
0°	441.4
2.5°	441.4
5°	439.5
7.5°	437.6
10°	434.7
12.5°	430.8
15°	427.0
17.5°	421.2
20°	415.4
22.5°	408.7
25°	401.0
27.5°	392.4
30°	383.7
32.5°	373.1
35°	362.5
37.5°	351.0
40°	339.5
42.5°	327.0
45°	313.5
47.5°	299.1
50°	284.7
52.5°	269.3
55°	253.9
57.5°	237.5
60°	221.2
62.5°	203.9
65°	186.6
67.5°	168.3
70°	150.0
72.5°	132.7
75°	115.4
77.5°	98.1
80°	83.7
82.5°	69.2
85°	56.7
87.5°	46.2
90°	37.5
92.5°	30.8
95°	25.0
97.5°	21.2
100°	18.3
102.5°	16.3
105°	15.4
107.5°	14.4
110°	13.5

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CANDELA DISTRIBUTION (continued):

	0°
112.5°	11.5
115°	10.6
117.5°	9.6
120°	8.7
122.5°	8.7
125°	7.7
127.5°	6.7
130°	5.8
132.5°	4.8
135°	4.8
137.5°	3.8
140°	3.8
142.5°	2.9
145°	2.9
147.5°	1.9
150°	1.9
152.5°	1.0
155°	1.0
157.5°	1.0
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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CATALOG NUMBER: FMNL1515F55-(black trim)-935

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	16.8	18.4	17.3	18.8	19.3	16.8	18.4	17.3	18.8	19.3
	3H	18.9	20.3	19.3	20.8	21.2	18.9	20.3	19.3	20.8	21.2
	4H	19.8	21.1	20.2	21.6	22.1	19.8	21.1	20.2	21.6	22.1
	6H	20.6	21.8	21.0	22.3	22.8	20.6	21.8	21.0	22.3	22.8
	8H	20.9	22.1	21.4	22.6	23.1	20.9	22.1	21.4	22.6	23.1
	12H	21.3	22.5	21.8	22.9	23.5	21.3	22.5	21.8	22.9	23.5
4H	2H	17.5	18.9	18.0	19.3	19.8	17.5	18.9	18.0	19.3	19.8
	3H	19.8	21.0	20.3	21.5	22.0	19.8	21.0	20.3	21.5	22.0
	4H	20.9	21.9	21.4	22.4	23.0	20.9	21.9	21.4	22.4	23.0
	6H	21.8	22.8	22.3	23.3	23.8	21.8	22.8	22.3	23.3	23.8
	8H	22.3	23.1	22.8	23.7	24.2	22.3	23.1	22.8	23.7	24.2
	12H	22.7	23.5	23.3	24.1	24.7	22.7	23.5	23.3	24.1	24.7
8H	4H	21.3	22.2	21.8	22.7	23.3	21.3	22.2	21.8	22.7	23.3
	6H	22.4	23.2	23.0	23.7	24.3	22.4	23.2	23.0	23.7	24.3
	8H	23.0	23.7	23.6	24.3	24.9	23.0	23.7	23.6	24.3	24.9
	12H	23.7	24.3	24.2	24.8	25.5	23.7	24.3	24.2	24.8	25.5
12H	4H	21.4	22.2	21.9	22.7	23.3	21.4	22.2	21.9	22.7	23.3
	6H	22.6	23.2	23.2	23.8	24.4	22.6	23.2	23.2	23.8	24.4
	8H	23.2	23.8	23.8	24.4	25.1	23.2	23.8	23.8	24.4	25.1

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

Report Prepared for

Cooper Lighting Solutions

Halo Home

Report Number: SP1-2506-468-15

Test Date: 07/09/2025

Luminaire Tested: FMNL1515FS5-3500K

Data in this report applies to families of products including FMNL1515FS5-3500K

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

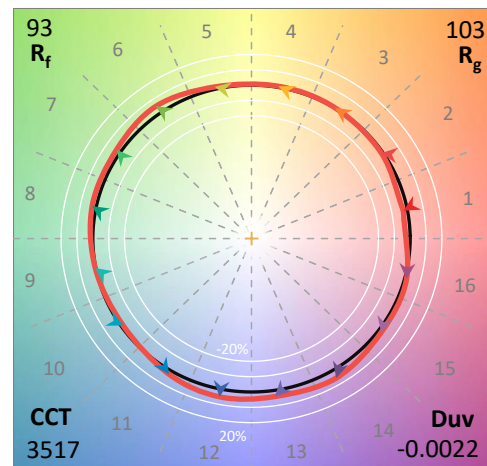
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2506-468-15
 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: **FMNL1515FS5-3500K**
 Description: HALO FLUSH MOUNT NIGHT LIGHT 15 INCH

Spectral Parameters

CCT (K): 3517
 CIE u' : 0.2364
 CIE v' : 0.5080
 Duv: -0.0022
 CIE x: 0.4021
 CIE y: 0.3841
 CIE z: 0.2139
 Peak Wavelength (nm): 630
 Dominant Wavelength (nm): 581
 Purity: 35.93442
 R_f: 92.8
 R_g: 103.1

CRI (Ra): 96.4
 R1: 98.7
 R2: 98.1
 R3: 93.5
 R4: 94.4
 R5: 99.1
 R6: 96.2
 R7: 96.0
 R8: 95.4
 R9: 86.0
 R10: 93.7
 R11: 91.5
 R12: 84.8
 R13: 99.5
 R14: 95.0
 R15: 99.1



Test Conditions

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

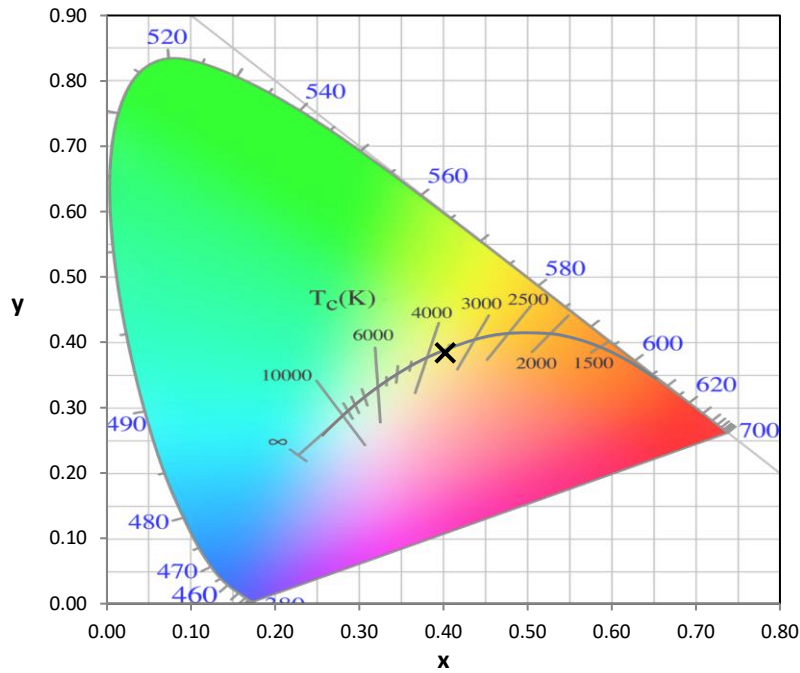
REPORT NUMBER: SP1-2506-468-15

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

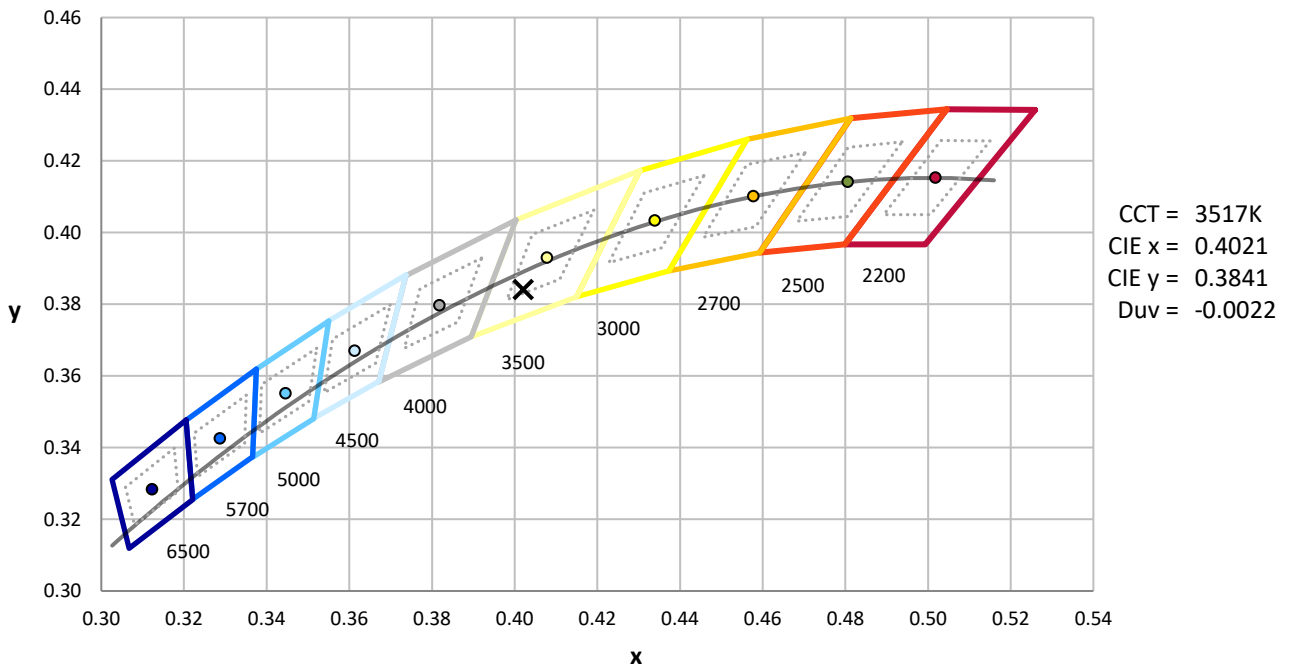
Sample Number	Condition	Description
P2506-468-LM.3	Good	HALO FLUSH MOUNT NIGHT LIGHT 15 INCH

REPORT NUMBER: SP1-2506-468-15

CIE 1931 Chromaticity Diagram



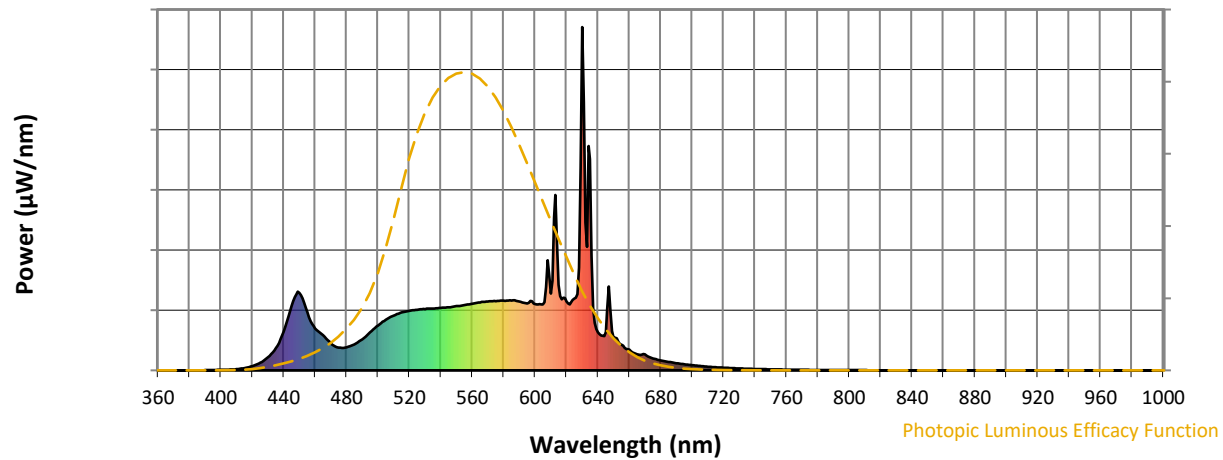
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3500K 4-step quadrangle

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Photopic Flux vs. Wavelength

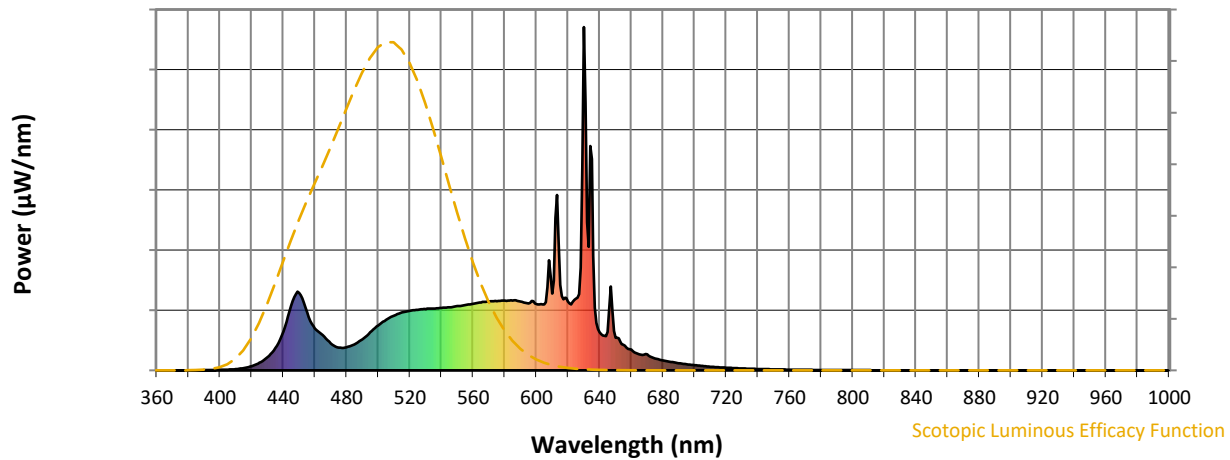


Photopic Lumens: NR

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	91	NR	620	201	NR	750	3	NR	880	0	NR
365	0	NR	495	111	NR	625	209	NR	755	3	NR	885	0	NR
370	0	NR	500	131	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	147	NR	635	616	NR	765	2	NR	895	0	NR
380	0	NR	510	159	NR	640	111	NR	770	2	NR	900	0	NR
385	0	NR	515	168	NR	645	112	NR	775	1	NR	905	0	NR
390	1	NR	520	173	NR	650	95	NR	780	1	NR	910	0	NR
395	1	NR	525	176	NR	655	74	NR	785	1	NR	915	0	NR
400	2	NR	530	178	NR	660	60	NR	790	1	NR	920	0	NR
405	2	NR	535	180	NR	665	47	NR	795	1	NR	925	0	NR
410	3	NR	540	182	NR	670	47	NR	800	1	NR	930	0	NR
415	7	NR	545	184	NR	675	35	NR	805	1	NR	935	0	NR
420	13	NR	550	187	NR	680	29	NR	810	1	NR	940	0	NR
425	22	NR	555	190	NR	685	25	NR	815	0	NR	945	0	NR
430	38	NR	560	194	NR	690	21	NR	820	0	NR	950	0	NR
435	65	NR	565	198	NR	695	18	NR	825	0	NR	955	0	NR
440	113	NR	570	200	NR	700	15	NR	830	0	NR	960	0	NR
445	189	NR	575	202	NR	705	13	NR	835	0	NR	965	0	NR
450	226	NR	580	204	NR	710	11	NR	840	0	NR	970	0	NR
455	169	NR	585	204	NR	715	9	NR	845	0	NR	975	0	NR
460	122	NR	590	201	NR	720	8	NR	850	0	NR	980	0	NR
465	102	NR	595	195	NR	725	7	NR	855	0	NR	985	0	NR
470	79	NR	600	193	NR	730	6	NR	860	0	NR	990	0	NR
475	66	NR	605	192	NR	735	5	NR	865	0	NR	995	0	NR
480	67	NR	610	224	NR	740	4	NR	870	0	NR	1000	0	NR
485	76	NR	615	249	NR	745	3	NR	875	0	NR			

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Scotopic Flux vs. Wavelength



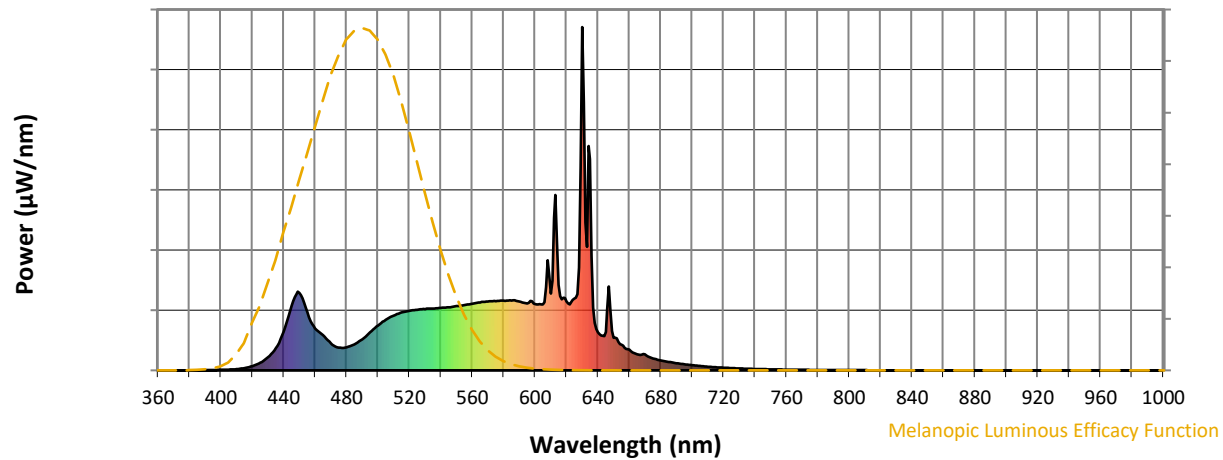
Scotopic Lumens: NR

S/P: 1.65

λ (nm)	Power W ^λ /nm	Lumens (Φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (Φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (Φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (Φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (Φ/nm)
360	0	NR	490	91	NR	620	201	NR	750	3	NR	880	0	NR
365	0	NR	495	111	NR	625	209	NR	755	3	NR	885	0	NR
370	0	NR	500	131	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	147	NR	635	616	NR	765	2	NR	895	0	NR
380	0	NR	510	159	NR	640	111	NR	770	2	NR	900	0	NR
385	0	NR	515	168	NR	645	112	NR	775	1	NR	905	0	NR
390	1	NR	520	173	NR	650	95	NR	780	1	NR	910	0	NR
395	1	NR	525	176	NR	655	74	NR	785	1	NR	915	0	NR
400	2	NR	530	178	NR	660	60	NR	790	1	NR	920	0	NR
405	2	NR	535	180	NR	665	47	NR	795	1	NR	925	0	NR
410	3	NR	540	182	NR	670	47	NR	800	1	NR	930	0	NR
415	7	NR	545	184	NR	675	35	NR	805	1	NR	935	0	NR
420	13	NR	550	187	NR	680	29	NR	810	1	NR	940	0	NR
425	22	NR	555	190	NR	685	25	NR	815	0	NR	945	0	NR
430	38	NR	560	194	NR	690	21	NR	820	0	NR	950	0	NR
435	65	NR	565	198	NR	695	18	NR	825	0	NR	955	0	NR
440	113	NR	570	200	NR	700	15	NR	830	0	NR	960	0	NR
445	189	NR	575	202	NR	705	13	NR	835	0	NR	965	0	NR
450	226	NR	580	204	NR	710	11	NR	840	0	NR	970	0	NR
455	169	NR	585	204	NR	715	9	NR	845	0	NR	975	0	NR
460	122	NR	590	201	NR	720	8	NR	850	0	NR	980	0	NR
465	102	NR	595	195	NR	725	7	NR	855	0	NR	985	0	NR
470	79	NR	600	193	NR	730	6	NR	860	0	NR	990	0	NR
475	66	NR	605	192	NR	735	5	NR	865	0	NR	995	0	NR
480	67	NR	610	224	NR	740	4	NR	870	0	NR	1000	0	NR
485	76	NR	615	249	NR	745	3	NR	875	0	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.35

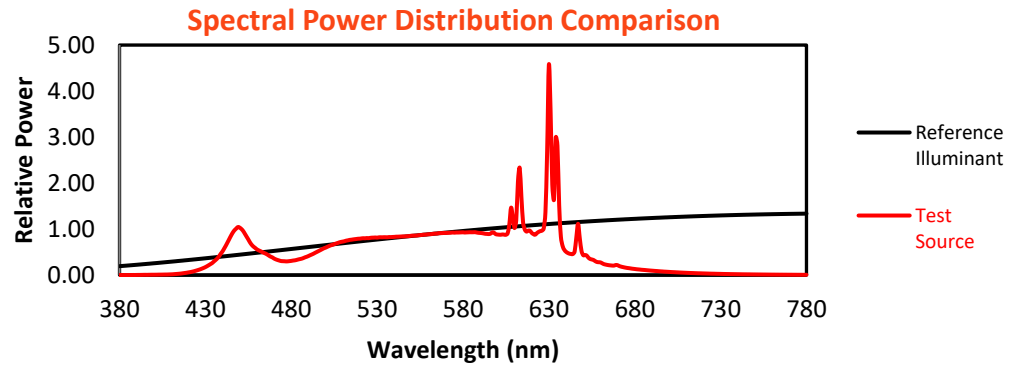
λ (nm)	Power W ^λ /nm	Lumens (φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (φ/nm)	λ (nm)	Power W ^λ /nm	Lumens (φ/nm)
360	0	NR	490	91	NR	620	201	NR	750	3	NR	880	0	NR
365	0	NR	495	111	NR	625	209	NR	755	3	NR	885	0	NR
370	0	NR	500	131	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	147	NR	635	616	NR	765	2	NR	895	0	NR
380	0	NR	510	159	NR	640	111	NR	770	2	NR	900	0	NR
385	0	NR	515	168	NR	645	112	NR	775	1	NR	905	0	NR
390	1	NR	520	173	NR	650	95	NR	780	1	NR	910	0	NR
395	1	NR	525	176	NR	655	74	NR	785	1	NR	915	0	NR
400	2	NR	530	178	NR	660	60	NR	790	1	NR	920	0	NR
405	2	NR	535	180	NR	665	47	NR	795	1	NR	925	0	NR
410	3	NR	540	182	NR	670	47	NR	800	1	NR	930	0	NR
415	7	NR	545	184	NR	675	35	NR	805	1	NR	935	0	NR
420	13	NR	550	187	NR	680	29	NR	810	1	NR	940	0	NR
425	22	NR	555	190	NR	685	25	NR	815	0	NR	945	0	NR
430	38	NR	560	194	NR	690	21	NR	820	0	NR	950	0	NR
435	65	NR	565	198	NR	695	18	NR	825	0	NR	955	0	NR
440	113	NR	570	200	NR	700	15	NR	830	0	NR	960	0	NR
445	189	NR	575	202	NR	705	13	NR	835	0	NR	965	0	NR
450	226	NR	580	204	NR	710	11	NR	840	0	NR	970	0	NR
455	169	NR	585	204	NR	715	9	NR	845	0	NR	975	0	NR
460	122	NR	590	201	NR	720	8	NR	850	0	NR	980	0	NR
465	102	NR	595	195	NR	725	7	NR	855	0	NR	985	0	NR
470	79	NR	600	193	NR	730	6	NR	860	0	NR	990	0	NR
475	66	NR	605	192	NR	735	5	NR	865	0	NR	995	0	NR
480	67	NR	610	224	NR	740	4	NR	870	0	NR	1000	0	NR
485	76	NR	615	249	NR	745	3	NR	875	0	NR			

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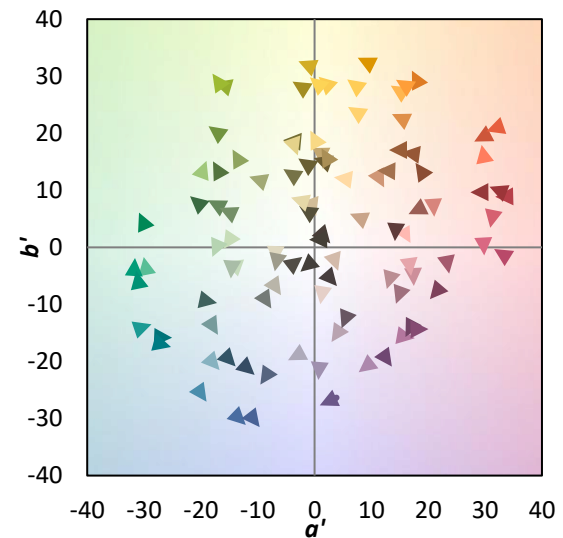
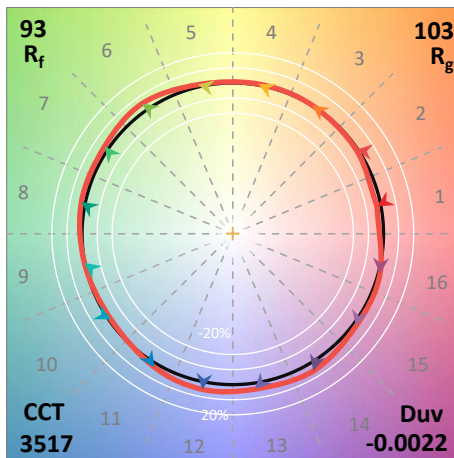
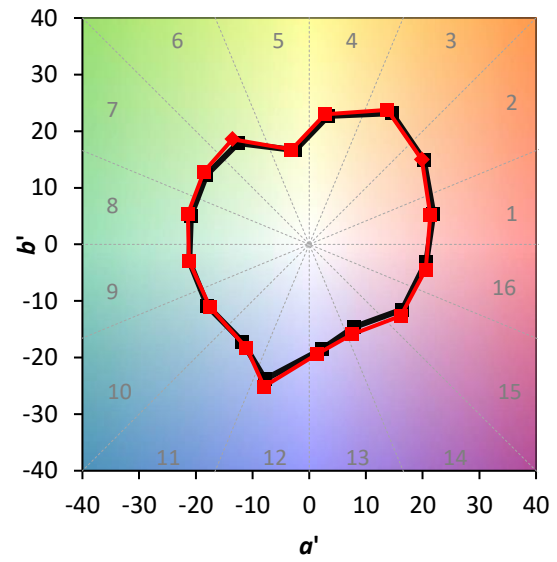
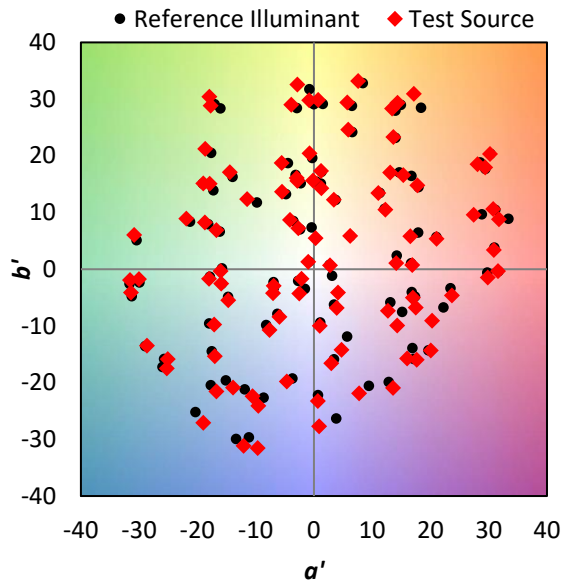
TM-30-18

Summary

$R_f = 92.8$
 $R_g = 103.1$
 $CIE R_a = 96.4$
 $R_g = 86.0$

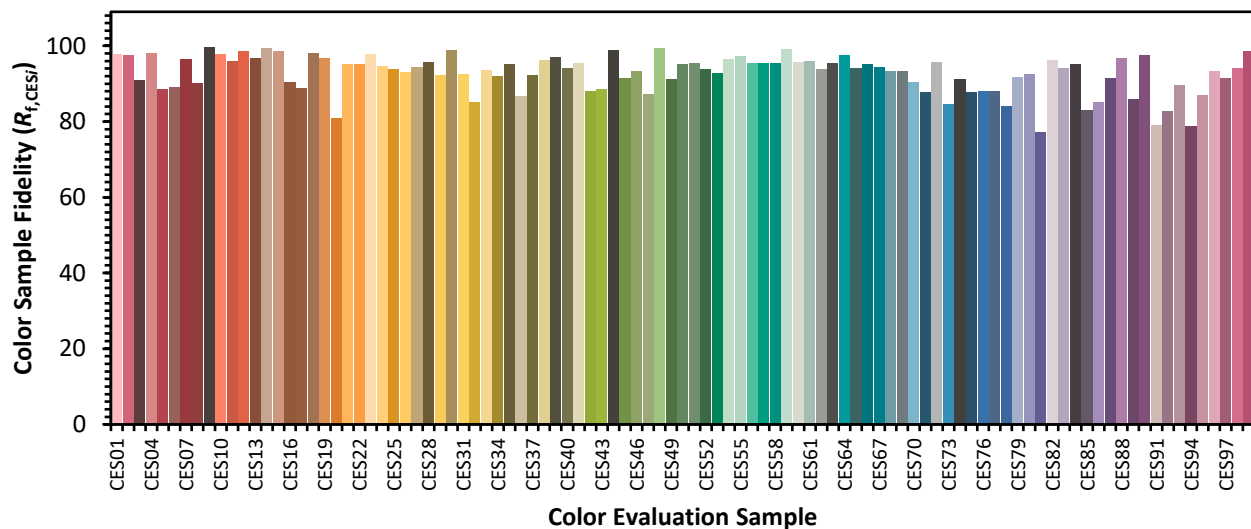


Color Vector Graphics

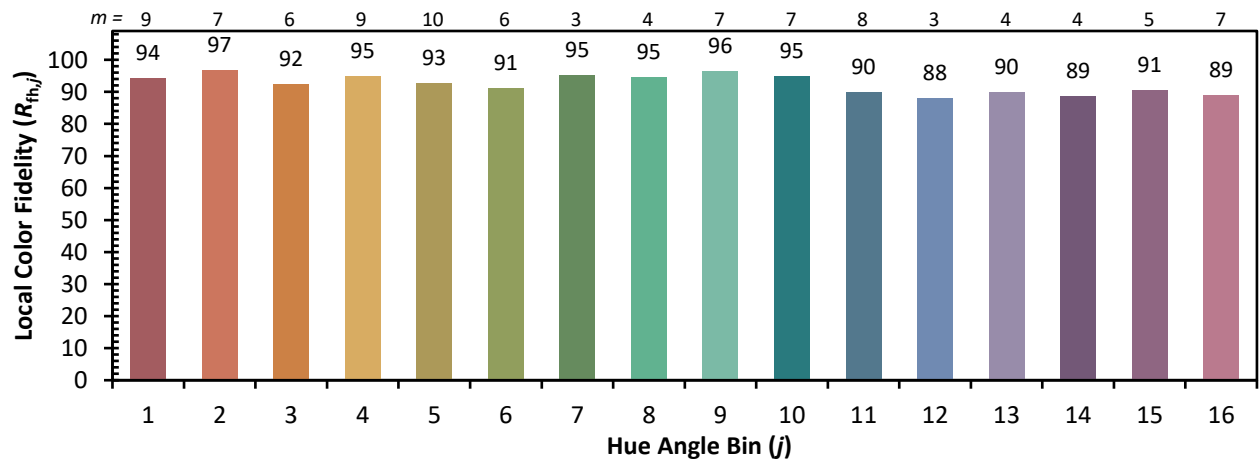
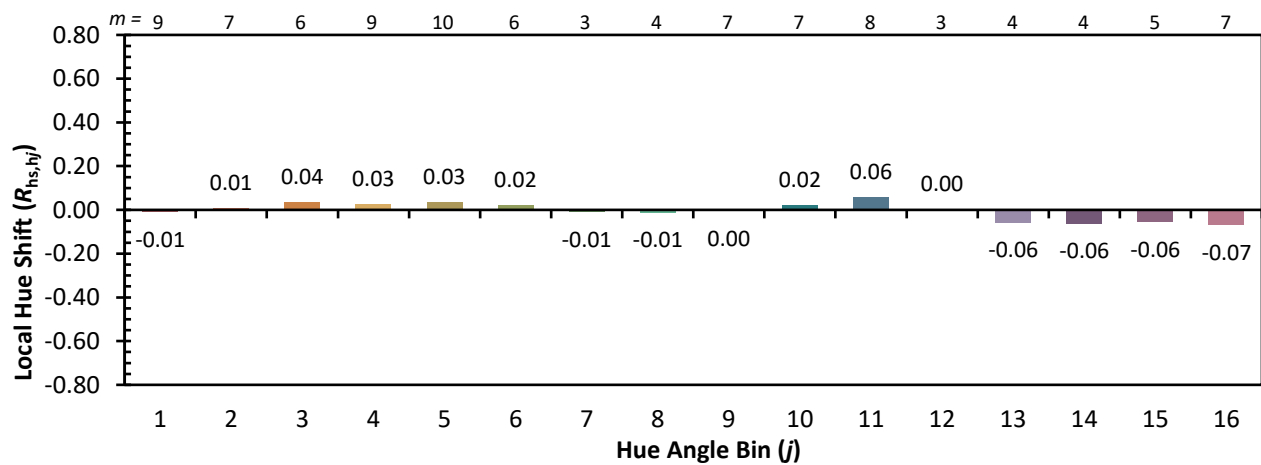
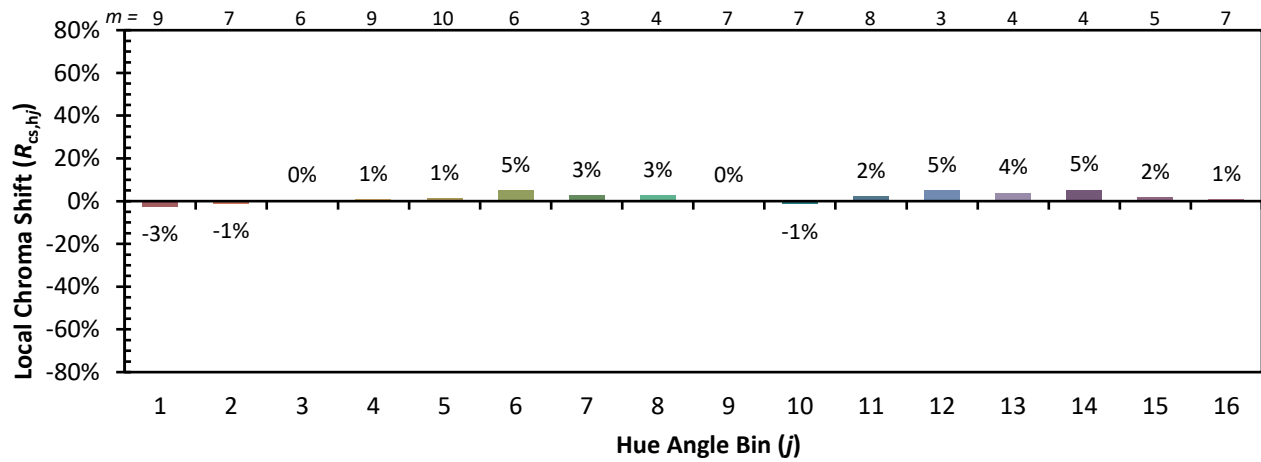


Individual Sample Fidelity Index ($R_{f,i}$)

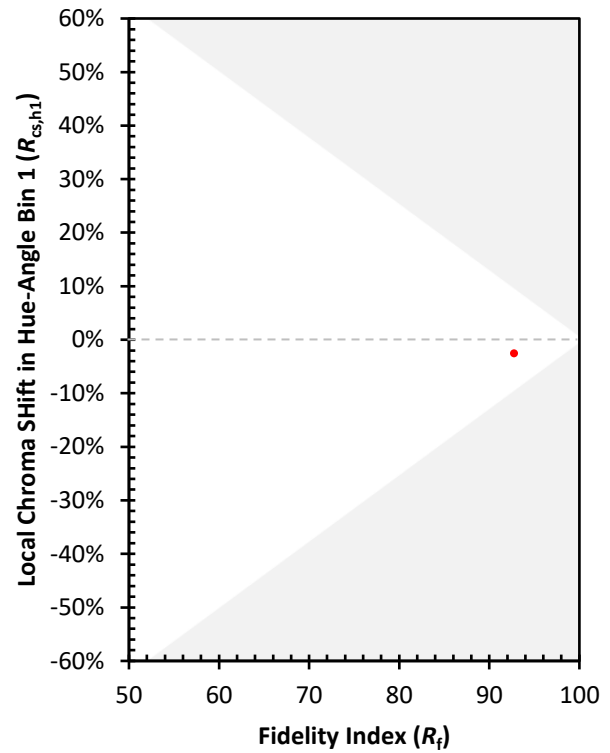
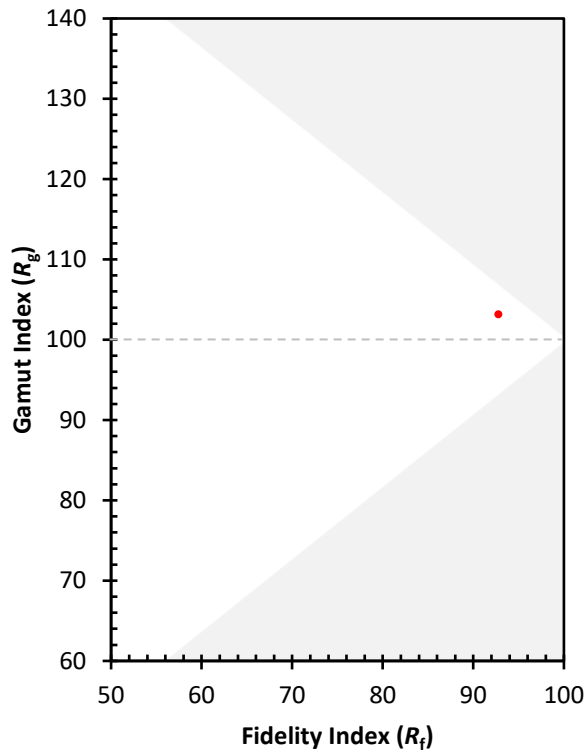
CES01 = 86	CES26 = 93	CES51 = 96	CES76 = 88
CES02 = 62	CES27 = 94	CES52 = 94	CES77 = 88
CES03 = 32	CES28 = 96	CES53 = 93	CES78 = 84
CES04 = 69	CES29 = 92	CES54 = 96	CES79 = 92
CES05 = 50	CES30 = 99	CES55 = 97	CES80 = 93
CES06 = 51	CES31 = 93	CES56 = 95	CES81 = 77
CES07 = 43	CES32 = 85	CES57 = 95	CES82 = 96
CES08 = 42	CES33 = 93	CES58 = 95	CES83 = 94
CES09 = 29	CES34 = 92	CES59 = 99	CES84 = 95
CES10 = 75	CES35 = 95	CES60 = 96	CES85 = 83
CES11 = 57	CES36 = 87	CES61 = 96	CES86 = 85
CES12 = 64	CES37 = 92	CES62 = 94	CES87 = 92
CES13 = 44	CES38 = 96	CES63 = 96	CES88 = 97
CES14 = 74	CES39 = 97	CES64 = 98	CES89 = 86
CES15 = 72	CES40 = 94	CES65 = 94	CES90 = 98
CES16 = 48	CES41 = 96	CES66 = 95	CES91 = 79
CES17 = 49	CES42 = 88	CES67 = 94	CES92 = 83
CES18 = 56	CES43 = 89	CES68 = 93	CES93 = 90
CES19 = 71	CES44 = 99	CES69 = 93	CES94 = 79
CES20 = 67	CES45 = 91	CES70 = 90	CES95 = 87
CES21 = 86	CES46 = 93	CES71 = 88	CES96 = 93
CES22 = 78	CES47 = 87	CES72 = 96	CES97 = 91
CES23 = 91	CES48 = 99	CES73 = 85	CES98 = 94
CES24 = 90	CES49 = 91	CES74 = 91	CES99 = 99
CES25 = 71	CES50 = 95	CES75 = 88	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)