

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: P1046635

Luminaire Tested: FMNL809FS5--940

Issue Date: 07/03/2025

Tested By:

Approved By:



Cooper Lighting Solutions laboratories have been accredited by National Voluntary Laboratory Accreditation Program (NVLAP) that it adheres to the requirements of ISO/IEC 17025:2005 and appropriate IESNA test methods. This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government. Results contained in this report are valid for luminaire sample tested, as supplied by requestor. Information related to the luminaire tested has been supplied by requestor and can affect the validity of the test results. Report shall not be reproduced except in full without approval of Cooper Lighting Solutions Lighting Laboratory. Test performed at address noted above.

Test Information

Test Method: LM-79-2019
 Report Number: P1046635
 Test Lab: Cooper lighting solutions
 Issue Date: 07/03/2025
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: HALO
 Catalog Number: FMNL809FS5--940
 Description: HALO 8 inch 90 CRI COLOR SELECTABLE flush mount White Trim FIXTURE with night light
 Light Source: 4000K CCT, 90 CRI LEDS
 Ballast/Driver: -

Summary

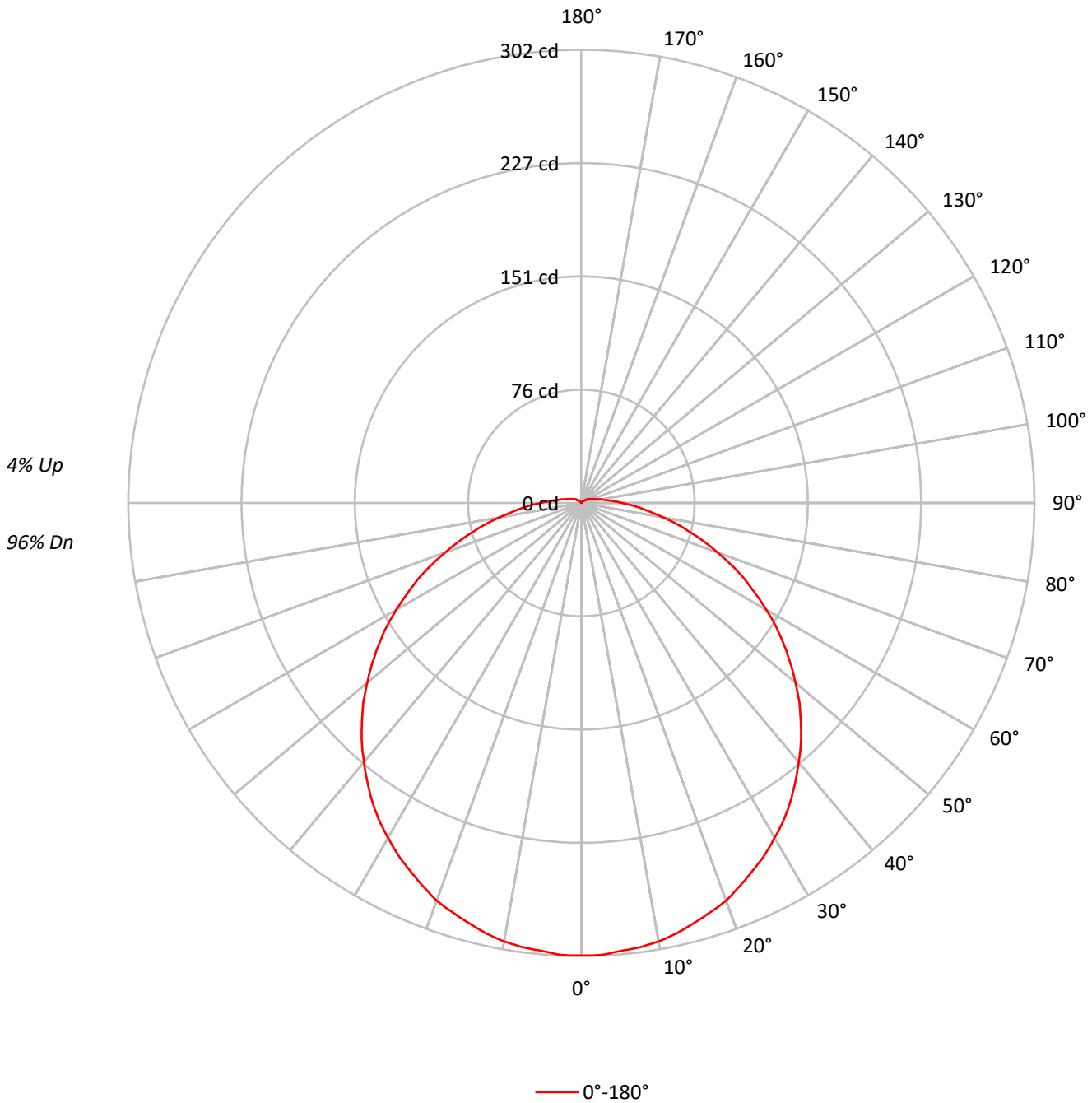
Lumens per Lamp: N/A
 Luminaire Lumens: 979.6 lumens
 Efficiency: N/A
 Efficacy: 96.0 lumens/watt
 Spacing Criteria (0/90/45): 1.27 / 1.27 / 1.39
 Luminous Opening: Circular (Dia: 0.7' x H: 0')
 CIE Type: Direct

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



TEST NUMBER: P1046635
 CATALOG NUMBER: FMNL809F55--940

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	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	115	115	115	115	109	109	109	103	103	103	98	98	98	96
1	106	101	96	92	103	98	94	90	93	90	86	89	86	83	84	82	80	77
2	96	87	80	74	93	85	78	73	81	75	70	77	72	68	73	69	66	63
3	87	76	68	61	85	74	66	60	71	64	58	67	62	57	64	59	55	53
4	80	67	58	51	77	66	57	51	63	55	49	60	53	48	57	52	47	45
5	73	60	51	44	71	59	50	43	56	48	43	54	47	42	51	45	41	39
6	68	54	45	38	65	53	44	38	51	43	37	48	42	36	46	40	36	34
7	63	49	40	34	61	48	39	33	46	38	33	44	37	32	42	36	32	30
8	58	45	36	30	56	44	35	30	42	35	29	40	34	29	39	33	28	26
9	54	41	32	27	53	40	32	27	39	31	26	37	31	26	36	30	26	24
10	51	38	30	24	50	37	29	24	36	29	24	34	28	23	33	27	23	21

AVERAGE LUMINANCE (cd/sqm):

	0°
0°	8436
5°	8414
10°	8427
15°	8394
20°	8397
25°	8345
30°	8323
35°	8297
40°	8233
45°	8184
50°	8111
55°	8046
60°	7971
65°	7948
70°	7900
75°	8127
80°	8955
85°	12837

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 87.5°
 Luminance: 21288 cd/sqm

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	28.5	2.9
10°-20°	81.9	8.4
20°-30°	124.8	12.7
30°-40°	151.9	15.5
40°-50°	159.7	16.3
50°-60°	147.5	15.1
60°-70°	118.5	12.1
70°-80°	79.9	8.2
80°-90°	44.0	4.5
90°-100°	21.0	2.1
100°-110°	10.9	1.1
110°-120°	6.2	0.6
120°-130°	3.2	0.3
130°-140°	1.3	0.1
140°-150°	0.3	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	235.2	24.0
0°-40°	387.1	39.5
0°-60°	694.3	70.9
0°-90°	936.7	95.6
90°-120°	38.1	3.9
90°-150°	42.9	4.4
90°-180°	43.0	4.4
0°-180°	979.6	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	302	
5°	300	29
15°	290	82
25°	270	125
35°	243	152
45°	207	160
55°	165	148
65°	120	119
75°	75	80
85°	40	36
90°	27	15
95°	18	14
105°	10	11
115°	6	6
125°	4	3
135°	2	1
145°	0	0
155°	0	0
165°	0	0
175°	0	0
180°	0	0

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CANDELA DISTRIBUTION (FULL):

0°	
0°	301.6
2.5°	301.6
5°	299.7
7.5°	298.7
10°	296.7
12.5°	293.8
15°	289.9
17.5°	286.0
20°	282.1
22.5°	276.2
25°	270.4
27.5°	264.5
30°	257.7
32.5°	250.9
35°	243.0
37.5°	234.3
40°	225.5
42.5°	216.7
45°	206.9
47.5°	197.2
50°	186.4
52.5°	175.7
55°	165.0
57.5°	154.2
60°	142.5
62.5°	130.8
65°	120.1
67.5°	108.3
70°	96.6
72.5°	85.9
75°	75.2
77.5°	65.4
80°	55.6
82.5°	46.9
85°	40.0
87.5°	33.2
90°	27.3
92.5°	22.5
95°	18.5
97.5°	15.6
100°	13.7
102.5°	11.7
105°	9.8
107.5°	8.8
110°	7.8

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CANDELA DISTRIBUTION (continued):

	0°
112.5°	6.8
115°	5.9
117.5°	5.9
120°	4.9
122.5°	3.9
125°	3.9
127.5°	2.9
130°	2.0
132.5°	2.0
135°	2.0
137.5°	1.0
140°	1.0
142.5°	1.0
145°	0.0
147.5°	0.0
150°	0.0
152.5°	0.0
155°	0.0
157.5°	0.0
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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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	19.0	20.6	19.5	21.0	21.4	19.0	20.6	19.5	21.0	21.4
	3H	21.1	22.5	21.5	22.9	23.4	21.1	22.5	21.5	22.9	23.4
	4H	22.0	23.3	22.4	23.8	24.2	22.0	23.3	22.4	23.8	24.2
	6H	22.8	24.1	23.3	24.5	25.0	22.8	24.1	23.3	24.5	25.0
	8H	23.2	24.4	23.7	24.9	25.4	23.2	24.4	23.7	24.9	25.4
	12H	23.6	24.8	24.1	25.2	25.8	23.6	24.8	24.1	25.2	25.8
4H	2H	19.7	21.1	20.2	21.5	22.0	19.7	21.1	20.2	21.5	22.0
	3H	22.0	23.2	22.5	23.6	24.1	22.0	23.2	22.5	23.6	24.1
	4H	23.0	24.1	23.5	24.6	25.1	23.0	24.1	23.5	24.6	25.1
	6H	24.0	25.0	24.6	25.5	26.0	24.0	25.0	24.6	25.5	26.0
	8H	24.5	25.4	25.0	25.9	26.5	24.5	25.4	25.0	25.9	26.5
	12H	25.1	25.8	25.6	26.4	27.0	25.1	25.8	25.6	26.4	27.0
8H	4H	23.5	24.3	24.0	24.9	25.4	23.5	24.3	24.0	24.9	25.4
	6H	24.7	25.4	25.2	26.0	26.5	24.7	25.4	25.2	26.0	26.5
	8H	25.3	26.0	25.9	26.5	27.1	25.3	26.0	25.9	26.5	27.1
	12H	26.0	26.6	26.6	27.2	27.8	26.0	26.6	26.6	27.2	27.8
12H	4H	23.6	24.3	24.1	24.9	25.5	23.6	24.3	24.1	24.9	25.5
	6H	24.8	25.5	25.4	26.0	26.7	24.8	25.5	25.4	26.0	26.7
	8H	25.5	26.1	26.1	26.7	27.3	25.5	26.1	26.1	26.7	27.3

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.

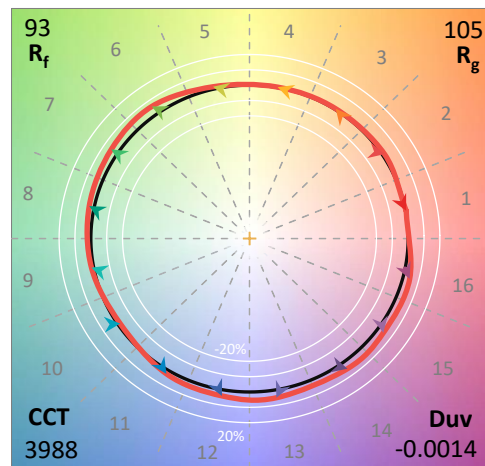
Test Information

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: **FMNL809F55-4000K**
 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	R9:	90.3
R2:	98.3	R10:	93.6
R3:	89.1	R11:	85.7
R4:	89.2	R12:	83.7
R5:	96.0	R13:	96.6
R6:	96.7	R14:	92.4
R7:	94.7	R15:	94.3
R8:	92.9		



Test Conditions

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

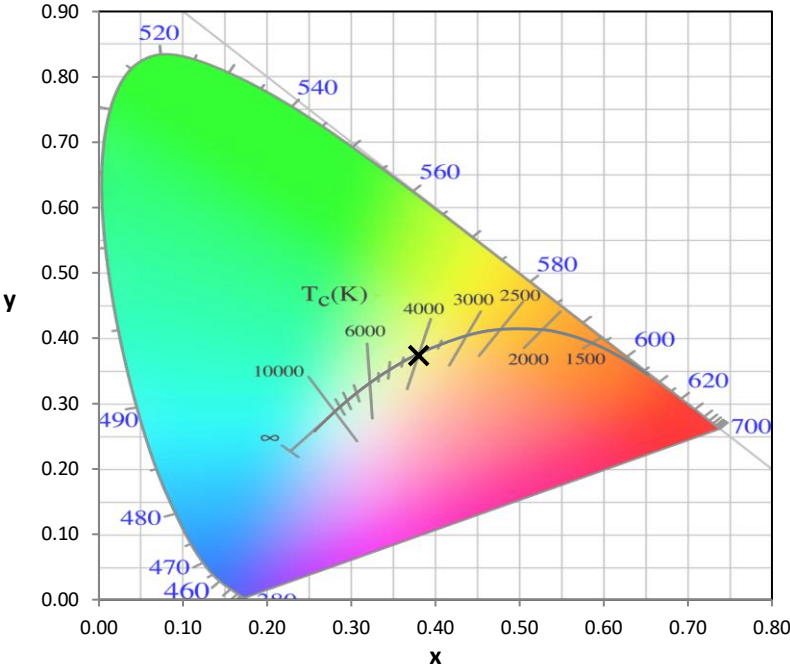
REPORT NUMBER: SP1-2506-468-4

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

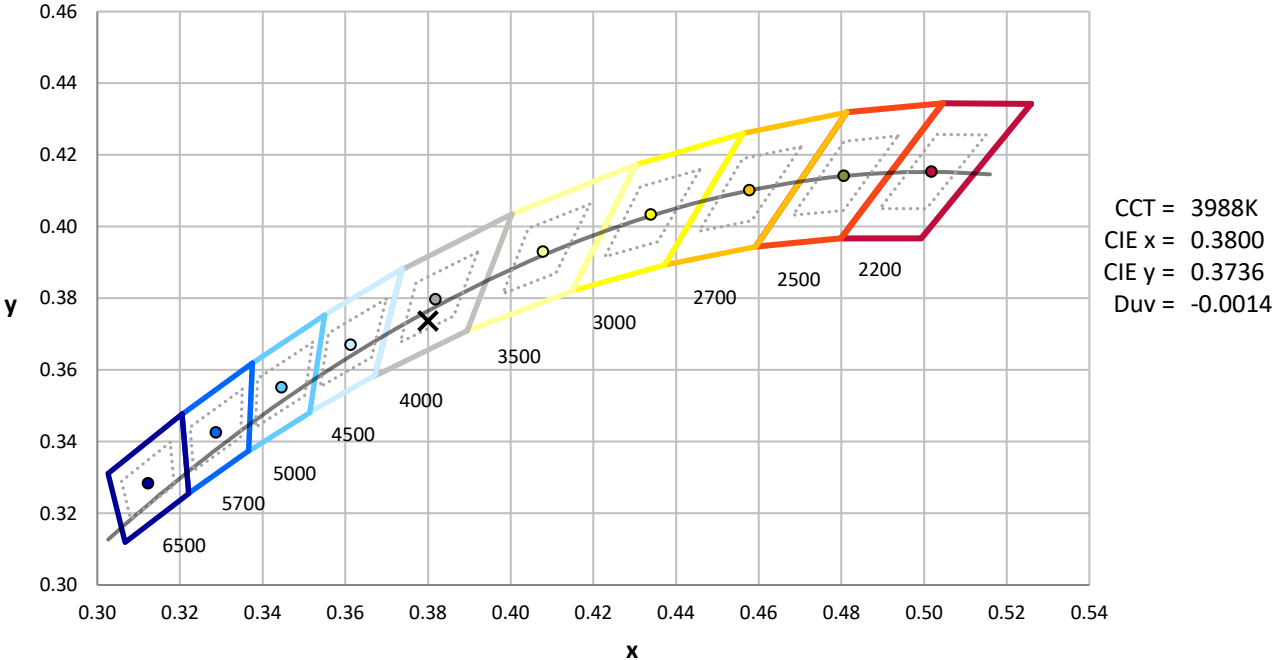
Sample Number	Condition	Description
P2506-468-LM.1	Good	HALO FLUSH MOUNT NIGHT LIGHT 8 INCH

REPORT NUMBER: SP1-2506-468-4

CIE 1931 Chromaticity Diagram



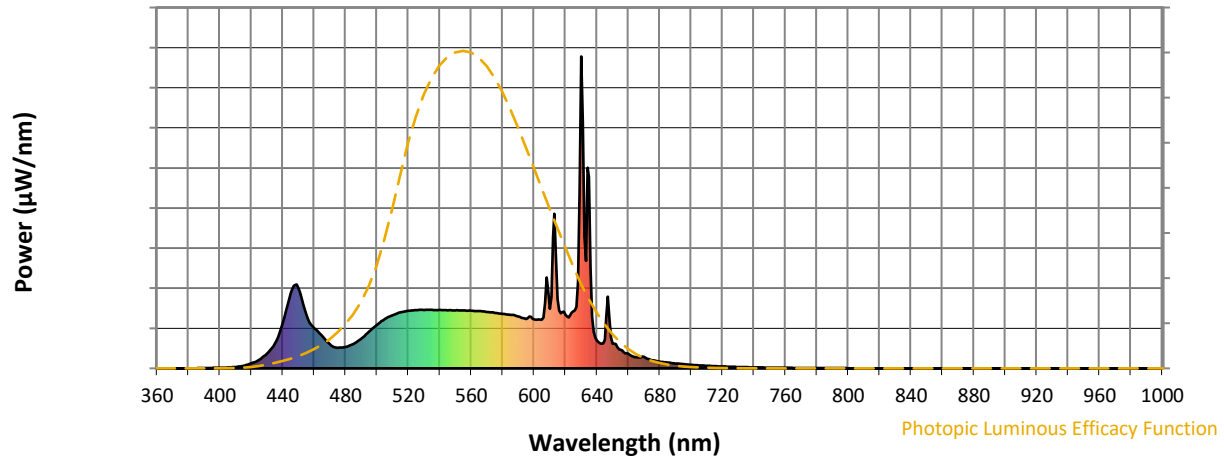
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

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Photopic Flux vs. Wavelength

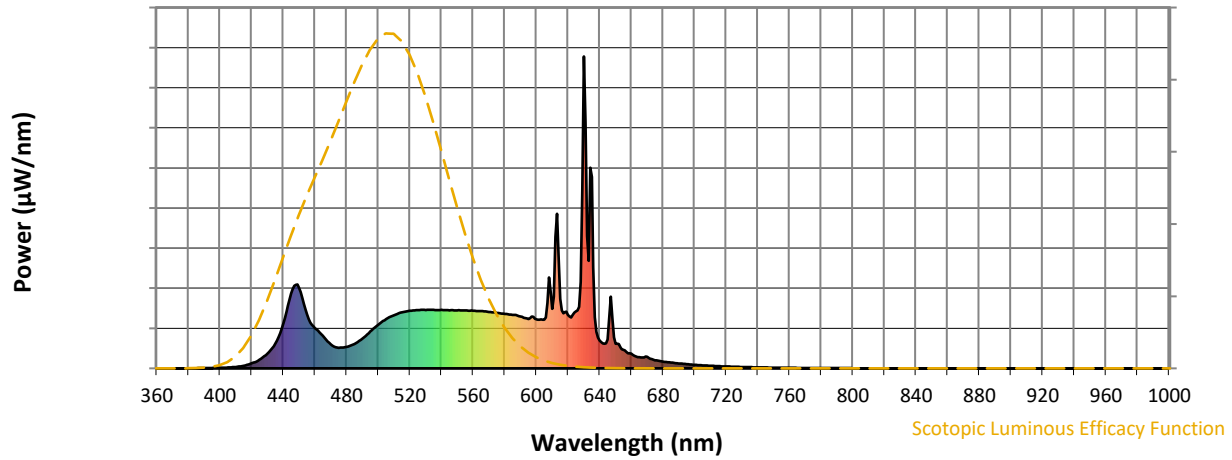


Photopic Lumens: NR

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			

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Scotopic Flux vs. Wavelength



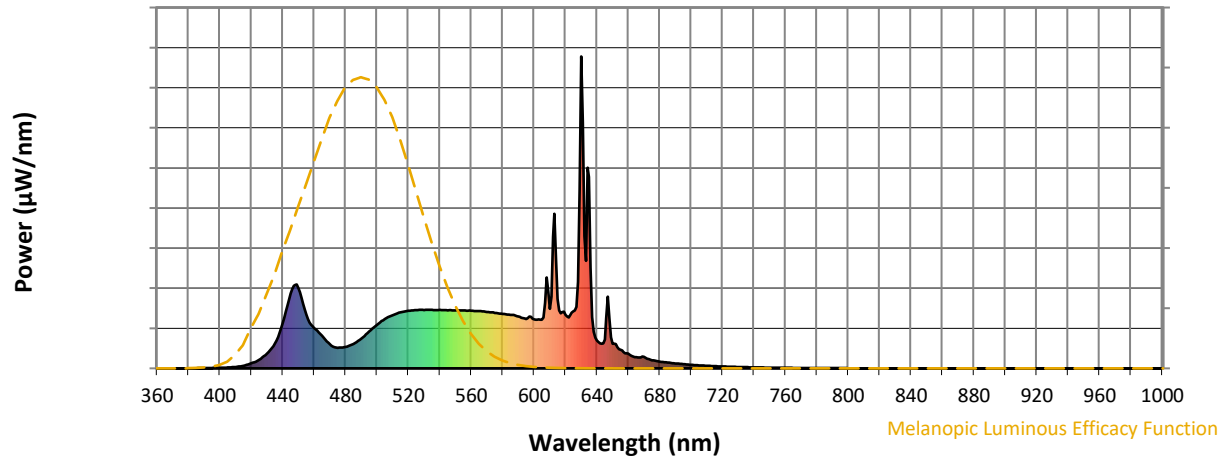
Scotopic Lumens: NR

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			

REPORT NUMBER: SP1-2506-468-4

Melanopic Flux vs. Wavelength



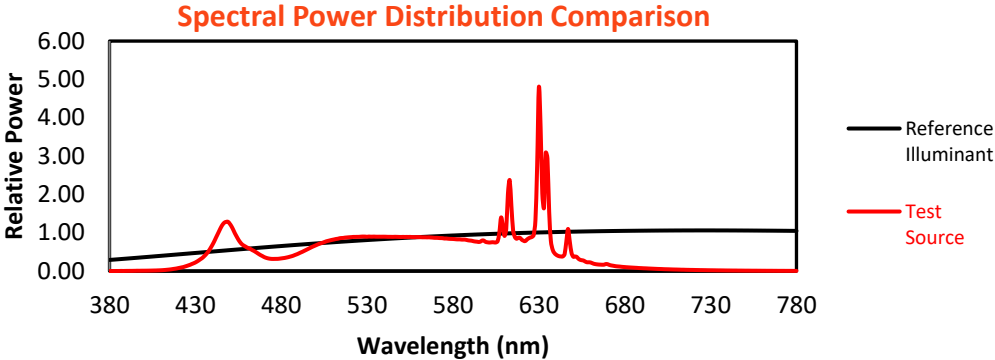
Melanopic Lumens: NR

M/P: 3.75

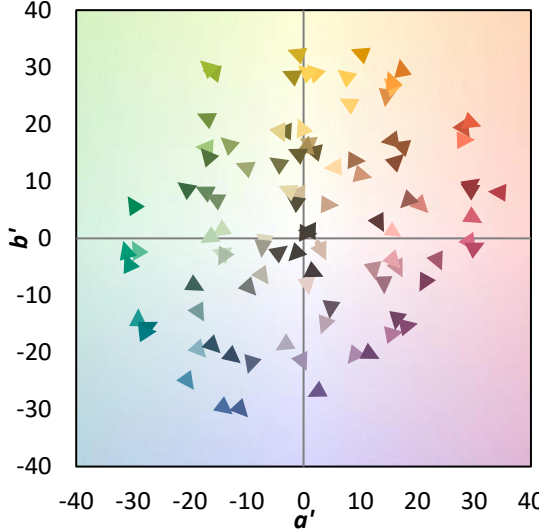
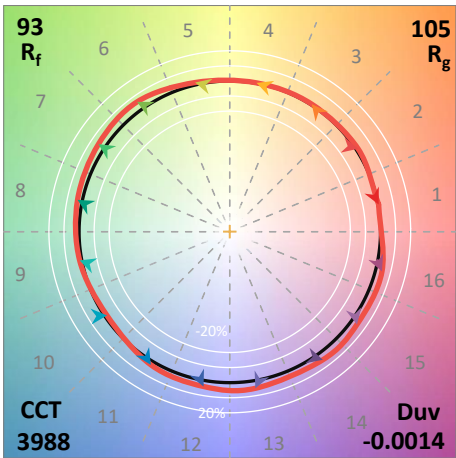
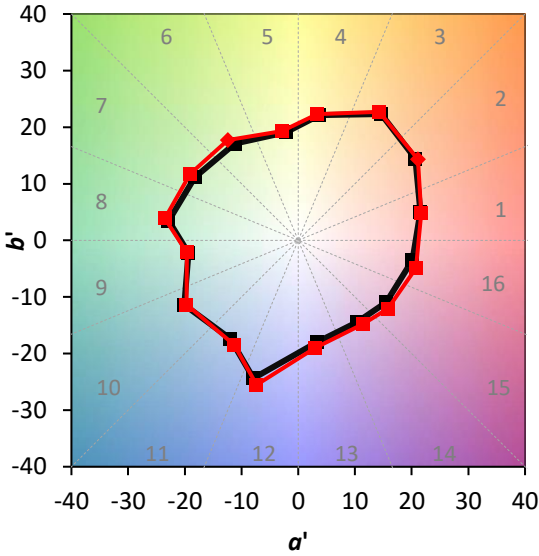
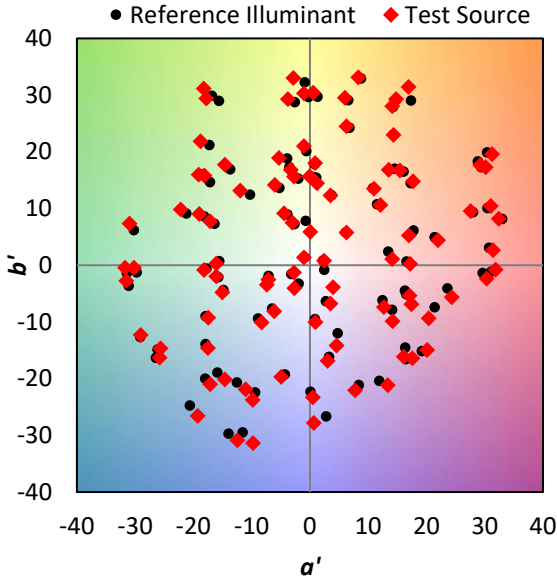
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	95	NR	620	171	NR	750	2	NR	880	0	NR
365	0	NR	495	118	NR	625	183	NR	755	2	NR	885	0	NR
370	0	NR	500	140	NR	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			

Summary

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

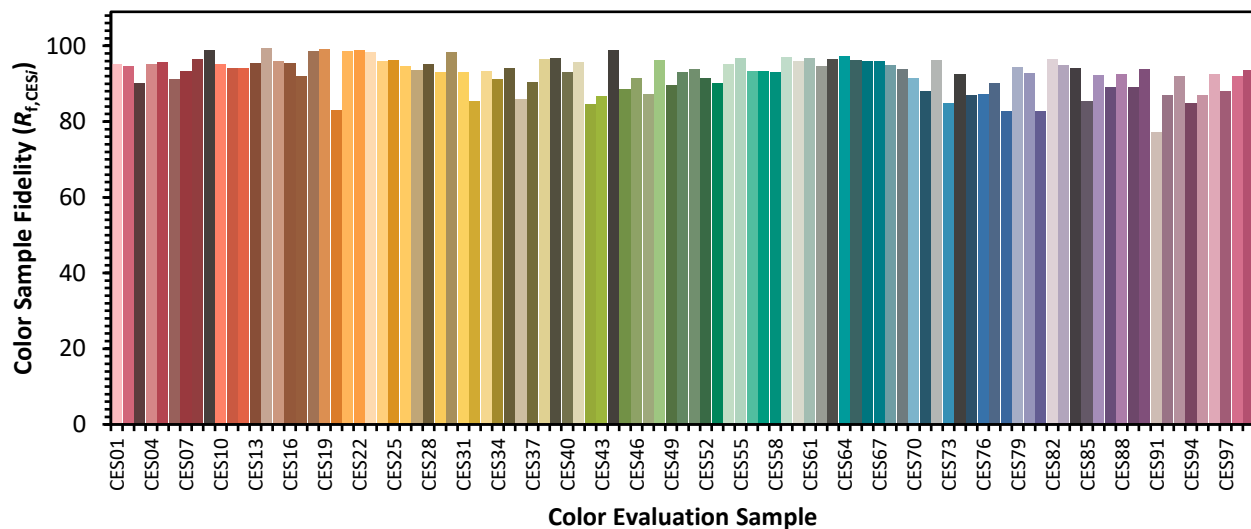


Color Vector Graphics

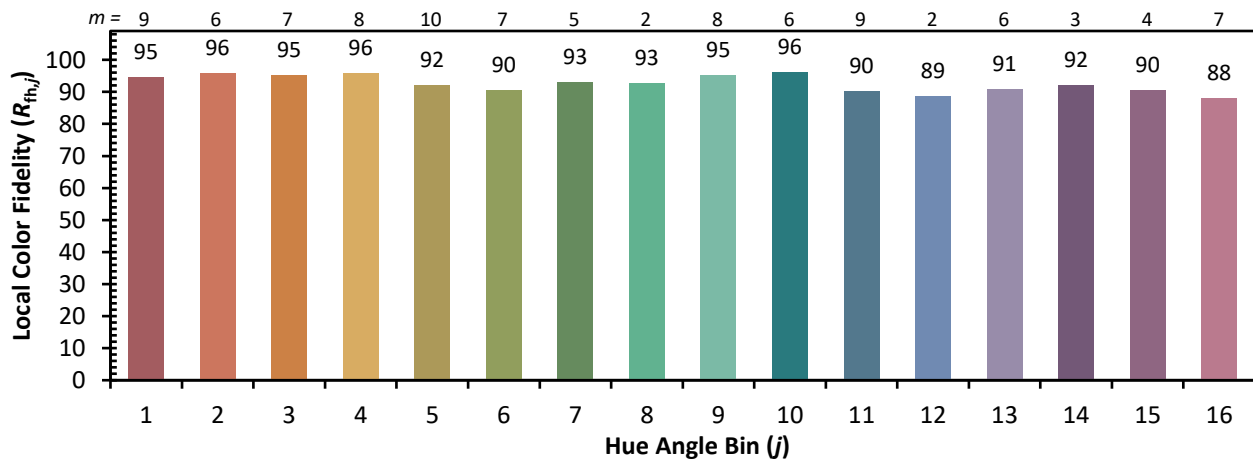
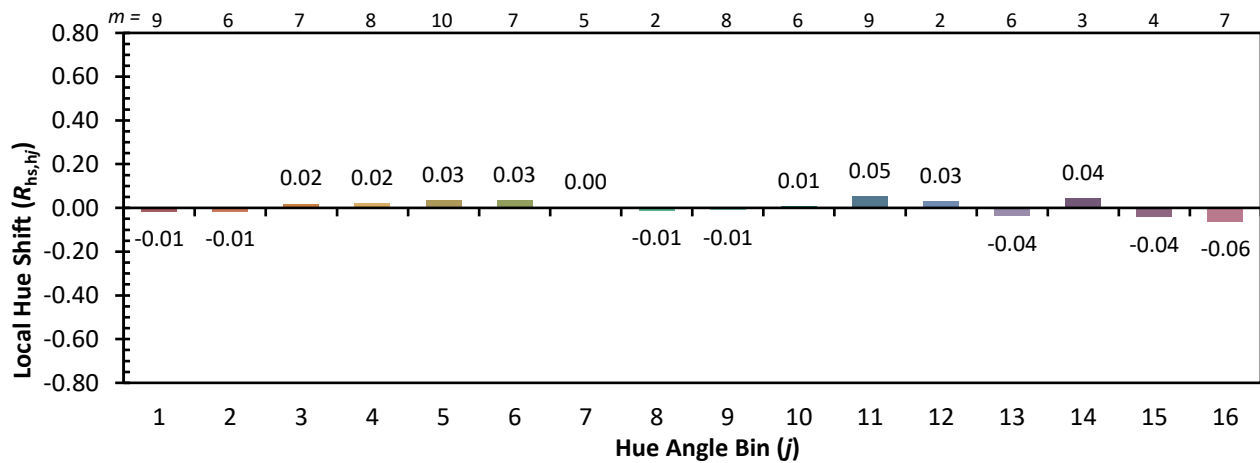
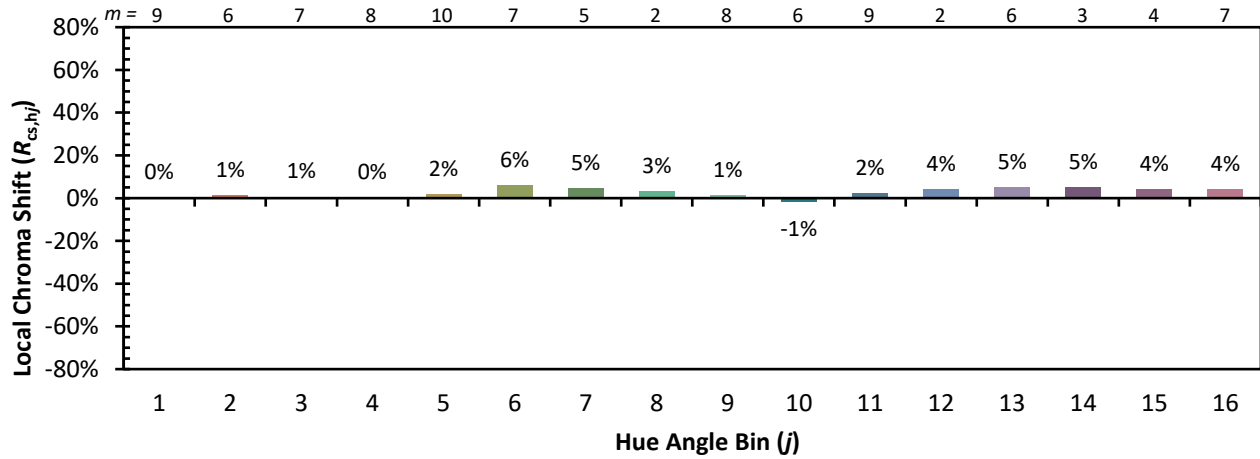


Individual Sample Fidelity Index ($R_{f,i}$)

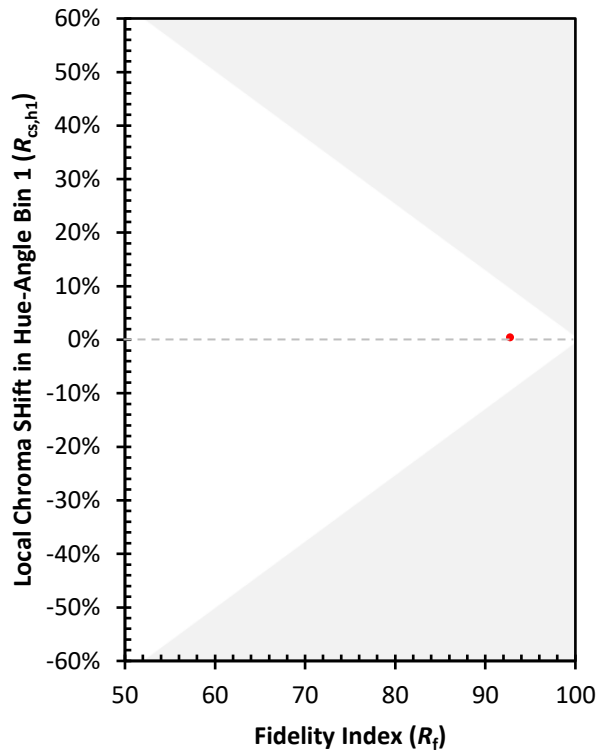
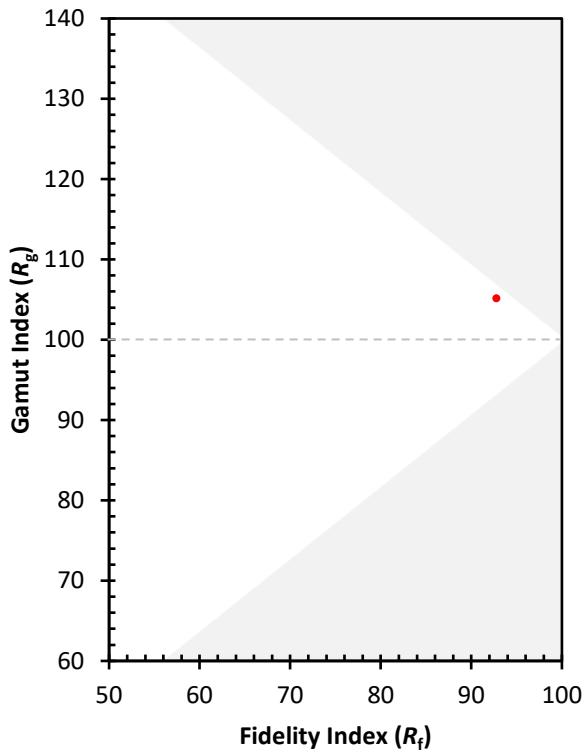
CES01 = 86	CES26 = 95	CES51 = 94	CES76 = 87
CES02 = 62	CES27 = 94	CES52 = 91	CES77 = 90
CES03 = 32	CES28 = 95	CES53 = 90	CES78 = 83
CES04 = 69	CES29 = 93	CES54 = 95	CES79 = 94
CES05 = 49	CES30 = 98	CES55 = 97	CES80 = 93
CES06 = 50	CES31 = 93	CES56 = 93	CES81 = 83
CES07 = 43	CES32 = 85	CES57 = 93	CES82 = 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	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)