

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: P1046661

Luminaire Tested: FMNL809FS5-(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: P1046661
Test Lab: Cooper lighting solutions
Issue Date: 07/03/2025
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: FMNL809FS5-(black trim)-950
Description: HALO 8 inch 90 CRI COLOR SELECTABLE flush mount Black Trim FIXTURE with night light
Light Source: 5000K CCT, 90 CRI LEDS
Ballast/Driver: -

Summary

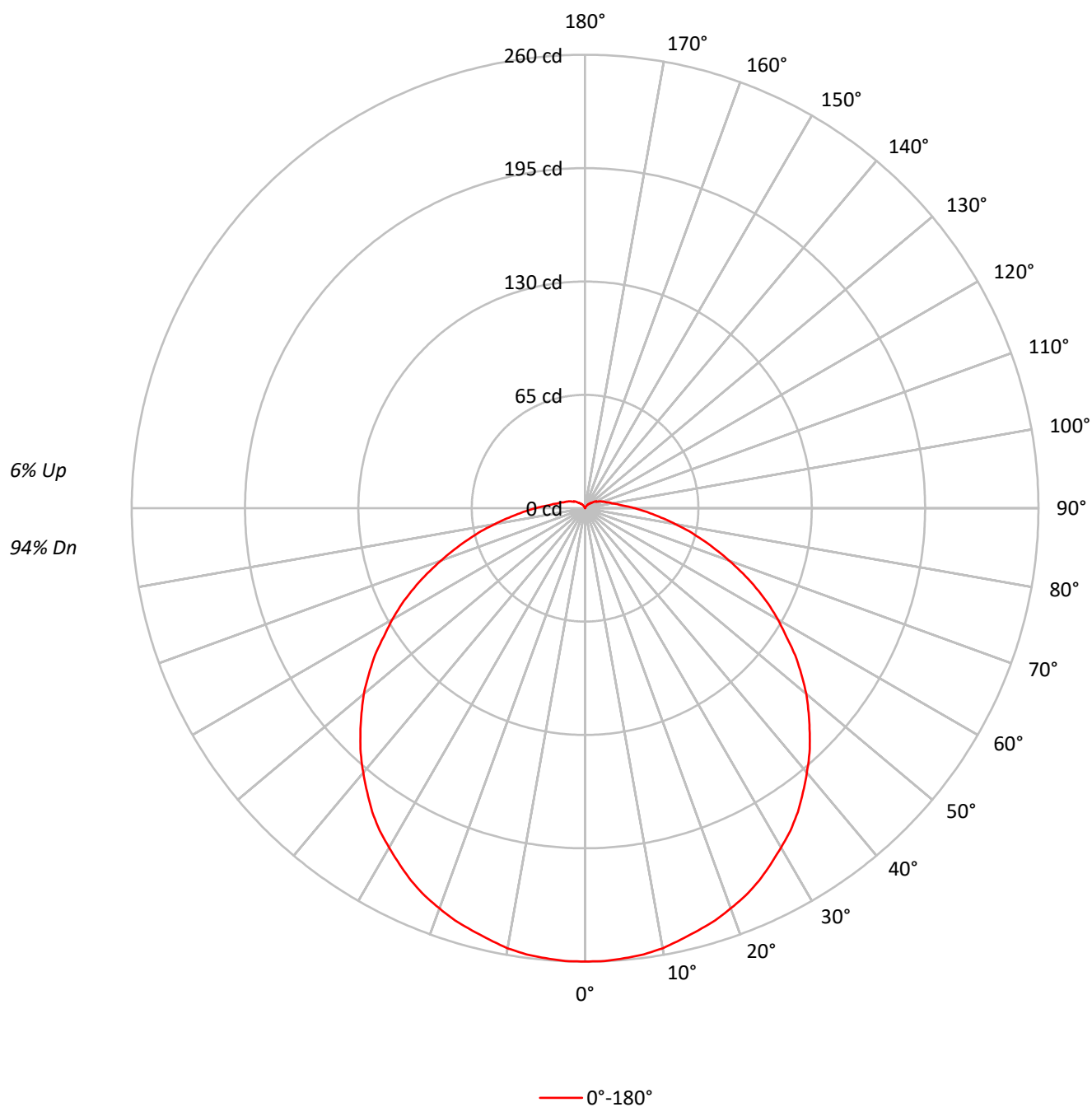
Lumens per Lamp: N/A
Luminaire Lumens: 889.8 lumens
Efficiency: N/A
Efficacy: 87.2 lumens/watt
Spacing Criteria (0/90/45): 1.29 / 1.29 / 1.41
Luminous Opening: Circular (Dia: 0.7' x H: 0')
CIE Type: Direct

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

TEST NUMBER: P1046661
CATALOG NUMBER: FMNL809FS5-(black trim)-950

Luminous Intensity Polar Plot



TEST NUMBER: P1046661

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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	50	30	10
RCR																	
0	118	118	118	118	114	114	114	114	108	108	108	102	102	102	96	96	96
1	106	100	95	91	102	97	93	89	92	88	85	87	84	81	82	80	78
2	96	87	79	73	92	84	77	72	79	74	69	75	71	66	71	67	64
3	87	76	67	60	84	73	66	59	70	63	57	66	60	55	62	58	54
4	79	67	57	50	76	65	56	50	62	54	48	58	52	47	55	50	46
5	73	59	50	43	70	58	49	43	55	47	42	52	46	41	50	44	39
6	67	53	44	37	65	52	43	37	50	42	36	47	41	35	45	39	35
7	62	48	39	33	60	47	39	33	45	37	32	43	36	31	41	35	31
8	58	44	35	29	56	43	35	29	41	34	28	39	33	28	38	32	27
9	54	40	32	26	52	39	31	26	38	31	26	36	30	25	35	29	25
10	50	37	29	24	49	36	29	24	35	28	23	34	27	23	32	26	22

AVERAGE LUMINANCE (cd/sqm):

	0°
0°	7269
5°	7272
10°	7276
15°	7256
20°	7268
25°	7277
30°	7257
35°	7263
40°	7226
45°	7207
50°	7206
55°	7173
60°	7138
65°	7161
70°	7188
75°	7500
80°	8488
85°	12451

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°

Vertical Angle: 87.5°

Luminance: 21353 cd/sqm

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	24.6	2.8
10°-20°	70.8	8.0
20°-30°	108.6	12.2
30°-40°	132.9	14.9
40°-50°	140.7	15.8
50°-60°	131.3	14.8
60°-70°	107.0	12.0
70°-80°	73.7	8.3
80°-90°	43.1	4.8
90°-100°	23.2	2.6
100°-110°	14.1	1.6
110°-120°	9.2	1.0
120°-130°	5.7	0.6
130°-140°	3.1	0.3
140°-150°	1.3	0.1
150°-160°	0.4	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	204.1	22.9
0°-40°	337.0	37.9
0°-60°	609.0	68.4
0°-90°	832.9	93.6
90°-120°	46.5	5.2
90°-150°	56.6	6.4
90°-180°	57.0	6.4
0°-180°	889.8	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	260	
5°	259	25
15°	251	71
25°	236	109
35°	213	133
45°	182	141
55°	147	131
65°	108	107
75°	69	74
85°	39	35
90°	29	16
95°	20	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°	259.9
2.5°	259.9
5°	259.0
7.5°	258.0
10°	256.2
12.5°	253.4
15°	250.6
17.5°	247.9
20°	244.2
22.5°	240.5
25°	235.8
27.5°	230.3
30°	224.7
32.5°	219.2
35°	212.7
37.5°	205.3
40°	197.9
42.5°	190.5
45°	182.2
47.5°	173.9
50°	165.6
52.5°	156.3
55°	147.1
57.5°	136.9
60°	127.6
62.5°	118.4
65°	108.2
67.5°	98.0
70°	87.9
72.5°	78.6
75°	69.4
77.5°	61.0
80°	52.7
82.5°	45.3
85°	38.8
87.5°	33.3
90°	28.7
92.5°	24.0
95°	20.3
97.5°	18.5
100°	15.7
102.5°	14.8
105°	12.9
107.5°	12.0
110°	11.1

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CANDELA DISTRIBUTION (continued):

	0°
112.5°	10.2
115°	9.2
117.5°	8.3
120°	7.4
122.5°	7.4
125°	6.5
127.5°	5.5
130°	4.6
132.5°	4.6
135°	3.7
137.5°	3.7
140°	2.8
142.5°	2.8
145°	1.8
147.5°	1.8
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	18.9	20.5	20.9	18.5	20.0	18.9	20.5	20.9
	3H	20.6	22.0	21.0	22.4	22.9	20.6	22.0	21.0	22.4	22.9
	4H	21.5	22.8	22.0	23.3	23.8	21.5	22.8	22.0	23.3	23.8
	6H	22.4	23.6	22.9	24.1	24.7	22.4	23.6	22.9	24.1	24.7
	8H	22.8	24.0	23.3	24.5	25.1	22.8	24.0	23.3	24.5	25.1
	12H	23.3	24.4	23.8	24.9	25.5	23.3	24.4	23.8	24.9	25.5
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	22.6	22.0	23.2	23.7	21.5	22.6	22.0	23.2	23.7
	4H	22.6	23.6	23.1	24.2	24.7	22.6	23.6	23.1	24.2	24.7
	6H	23.7	24.6	24.2	25.1	25.7	23.7	24.6	24.2	25.1	25.7
	8H	24.2	25.1	24.8	25.6	26.2	24.2	25.1	24.8	25.6	26.2
	12H	24.8	25.6	25.4	26.1	26.8	24.8	25.6	25.4	26.1	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	24.3	25.1	24.9	25.7	26.3	24.3	25.1	24.9	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	23.1	23.9	23.7	24.5	25.1	23.1	23.9	23.7	24.5	25.1
	6H	24.5	25.2	25.1	25.7	26.4	24.5	25.2	25.1	25.7	26.4
	8H	25.3	25.9	25.9	26.5	27.1	25.3	25.9	25.9	26.5	27.1

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

Report Prepared for

Cooper Lighting Solutions

Halo Home

Report Number: SP1-2506-468-5

Test Date: 07/08/2025

Luminaire Tested: FMNL809FS5-5000K

Data in this report applies to families of products including FMNL809FS5-5000K

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

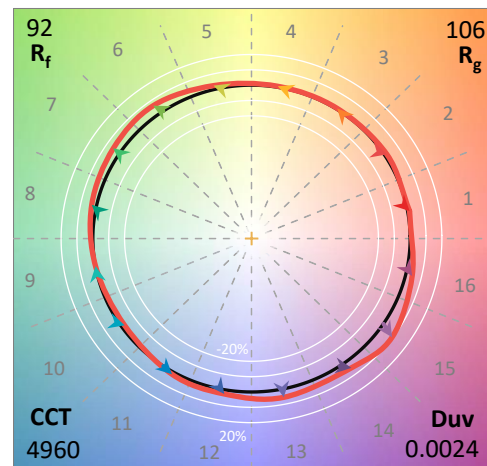
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2506-468-5
 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: **FMNL809F55-5000K**
 Description: HALO FLUSH MOUNT NIGHT LIGHT 8 INCH

Spectral Parameters

CCT (K): 4960
 CIE u' : 0.2102
 CIE v' : 0.4878
 Duv: 0.0024
 CIE x: 0.3467
 CIE y: 0.3576
 CIE z: 0.2956
 Peak Wavelength (nm): 630
 Dominant Wavelength (nm): 571
 Purity: 11.3522
 R_f: 92.2
 R_g: 105.8

CRI (Ra): 92.9
 R1: 95.6
 R2: 96.3
 R3: 86.3
 R4: 90.0
 R5: 97.8
 R6: 94.6
 R7: 92.8
 R8: 89.4
 R9: 81.7
 R10: 88.8
 R11: 86.8
 R12: 75.0
 R13: 97.6
 R14: 91.3
 R15: 94.0



Test Conditions

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

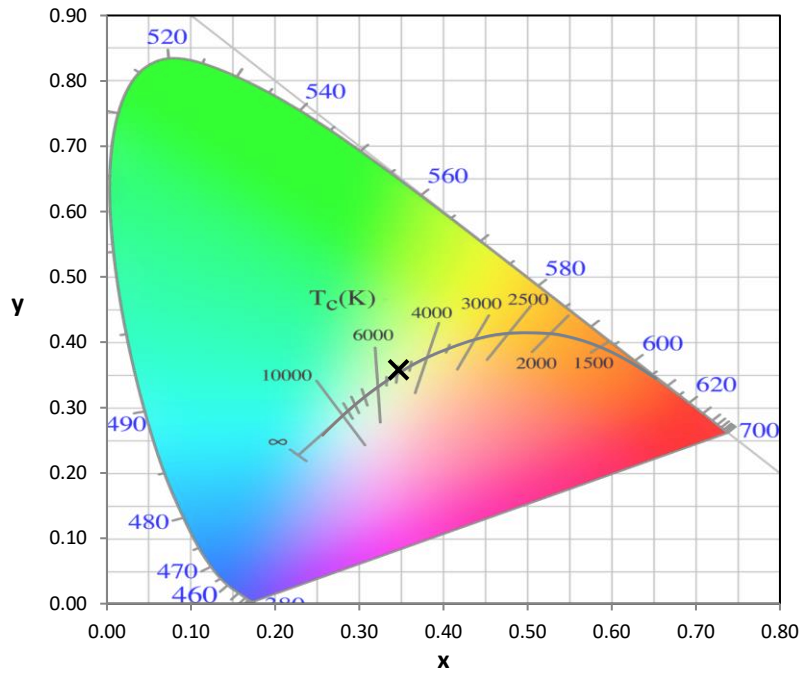
REPORT NUMBER: SP1-2506-468-5

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

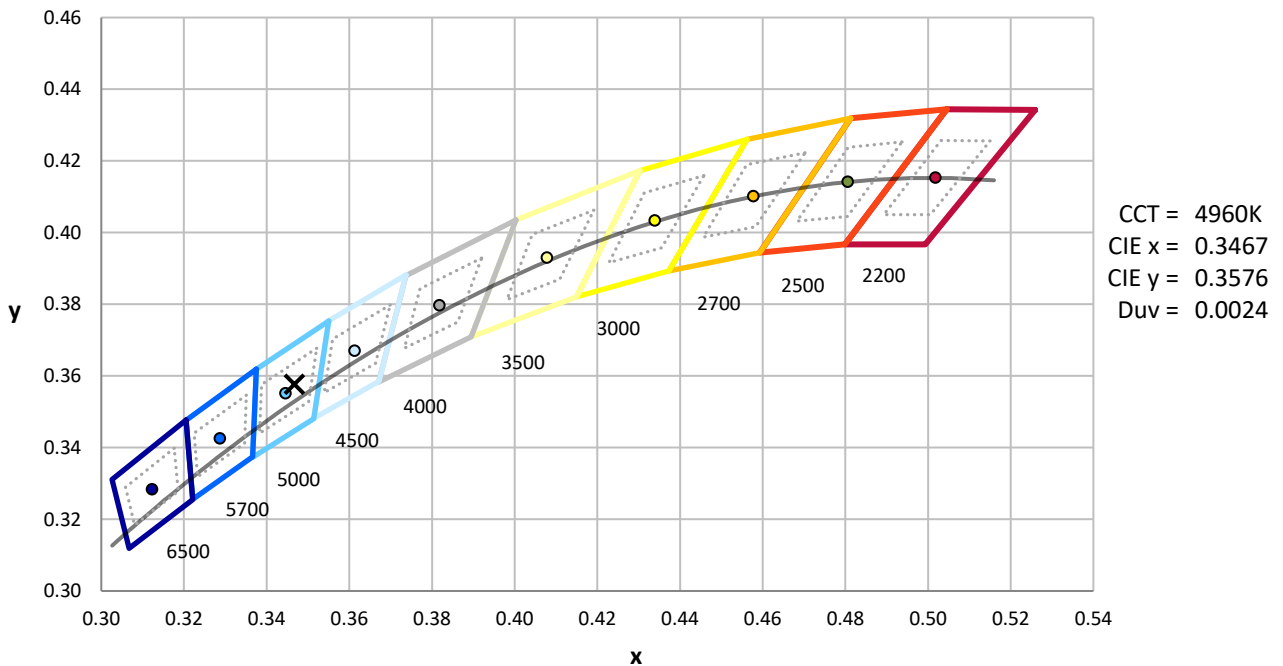
Sample Number	Condition	Description
P2506-468-LM.1	Good	HALO FLUSH MOUNT NIGHT LIGHT 8 INCH

REPORT NUMBER: SP1-2506-468-5

CIE 1931 Chromaticity Diagram



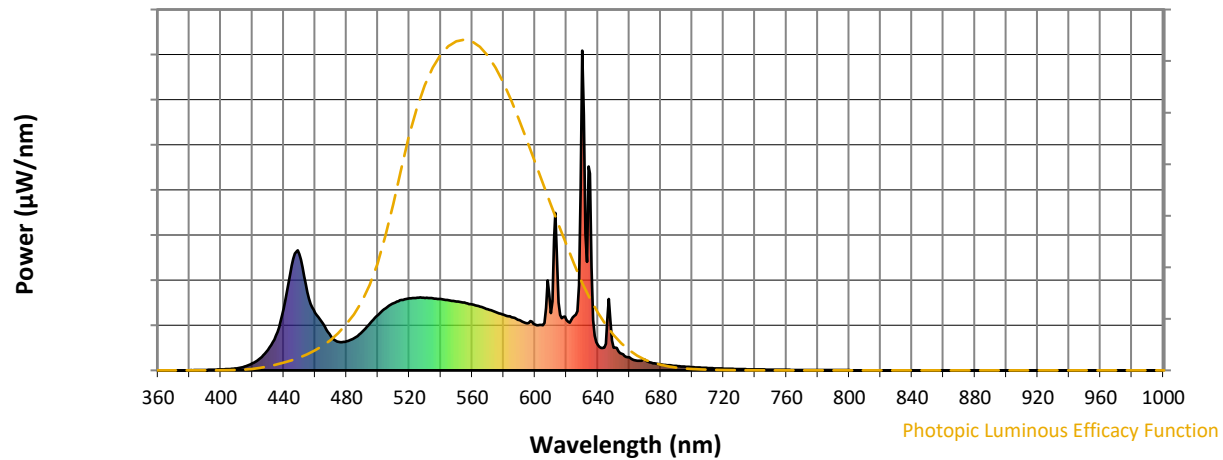
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 4-step quadrangle

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Photopic Flux vs. Wavelength

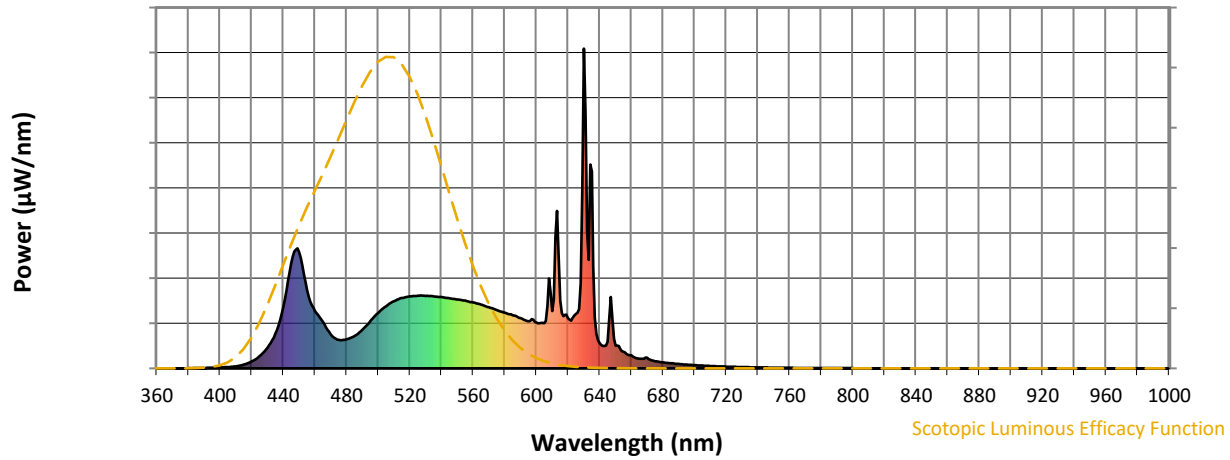


Photopic Lumens: NR

λ (nm)	Power W ^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	121	NR	620	157	NR	750	2	NR	880	0	NR
365	0	NR	495	148	NR	625	170	NR	755	2	NR	885	0	NR
370	0	NR	500	173	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	194	NR	635	615	NR	765	1	NR	895	0	NR
380	0	NR	510	210	NR	640	79	NR	770	1	NR	900	0	NR
385	1	NR	515	220	NR	645	84	NR	775	1	NR	905	0	NR
390	1	NR	520	225	NR	650	71	NR	780	1	NR	910	0	NR
395	2	NR	525	227	NR	655	52	NR	785	1	NR	915	0	NR
400	3	NR	530	226	NR	660	41	NR	790	1	NR	920	0	NR
405	4	NR	535	225	NR	665	30	NR	795	1	NR	925	0	NR
410	6	NR	540	223	NR	670	33	NR	800	1	NR	930	0	NR
415	12	NR	545	219	NR	675	23	NR	805	0	NR	935	0	NR
420	22	NR	550	215	NR	680	19	NR	810	0	NR	940	0	NR
425	38	NR	555	212	NR	685	16	NR	815	0	NR	945	0	NR
430	64	NR	560	206	NR	690	14	NR	820	0	NR	950	0	NR
435	109	NR	565	199	NR	695	12	NR	825	0	NR	955	0	NR
440	193	NR	570	191	NR	700	10	NR	830	0	NR	960	0	NR
445	328	NR	575	182	NR	705	9	NR	835	0	NR	965	0	NR
450	363	NR	580	174	NR	710	7	NR	840	0	NR	970	0	NR
455	245	NR	585	166	NR	715	6	NR	845	0	NR	975	0	NR
460	180	NR	590	157	NR	720	5	NR	850	0	NR	980	0	NR
465	146	NR	595	147	NR	725	5	NR	855	0	NR	985	0	NR
470	106	NR	600	143	NR	730	4	NR	860	0	NR	990	0	NR
475	89	NR	605	141	NR	735	3	NR	865	0	NR	995	0	NR
480	91	NR	610	179	NR	740	3	NR	870	0	NR	1000	0	NR
485	101	NR	615	213	NR	745	3	NR	875	0	NR			

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Scotopic Flux vs. Wavelength



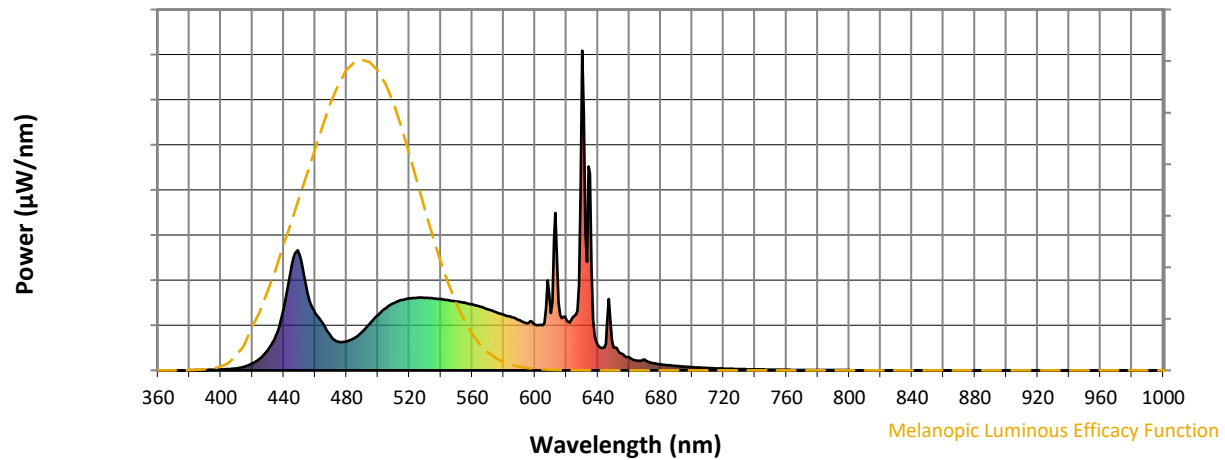
Scotopic Lumens: NR

S/P: 2.07

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	121	NR	620	157	NR	750	2	NR	880	0	NR
365	0	NR	495	148	NR	625	170	NR	755	2	NR	885	0	NR
370	0	NR	500	173	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	194	NR	635	615	NR	765	1	NR	895	0	NR
380	0	NR	510	210	NR	640	79	NR	770	1	NR	900	0	NR
385	1	NR	515	220	NR	645	84	NR	775	1	NR	905	0	NR
390	1	NR	520	225	NR	650	71	NR	780	1	NR	910	0	NR
395	2	NR	525	227	NR	655	52	NR	785	1	NR	915	0	NR
400	3	NR	530	226	NR	660	41	NR	790	1	NR	920	0	NR
405	4	NR	535	225	NR	665	30	NR	795	1	NR	925	0	NR
410	6	NR	540	223	NR	670	33	NR	800	1	NR	930	0	NR
415	12	NR	545	219	NR	675	23	NR	805	0	NR	935	0	NR
420	22	NR	550	215	NR	680	19	NR	810	0	NR	940	0	NR
425	38	NR	555	212	NR	685	16	NR	815	0	NR	945	0	NR
430	64	NR	560	206	NR	690	14	NR	820	0	NR	950	0	NR
435	109	NR	565	199	NR	695	12	NR	825	0	NR	955	0	NR
440	193	NR	570	191	NR	700	10	NR	830	0	NR	960	0	NR
445	328	NR	575	182	NR	705	9	NR	835	0	NR	965	0	NR
450	363	NR	580	174	NR	710	7	NR	840	0	NR	970	0	NR
455	245	NR	585	166	NR	715	6	NR	845	0	NR	975	0	NR
460	180	NR	590	157	NR	720	5	NR	850	0	NR	980	0	NR
465	146	NR	595	147	NR	725	5	NR	855	0	NR	985	0	NR
470	106	NR	600	143	NR	730	4	NR	860	0	NR	990	0	NR
475	89	NR	605	141	NR	735	3	NR	865	0	NR	995	0	NR
480	91	NR	610	179	NR	740	3	NR	870	0	NR	1000	0	NR
485	101	NR	615	213	NR	745	3	NR	875	0	NR			

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Melanopic Flux vs. Wavelength


Melanopic Lumens: NR
M/P: 4.39

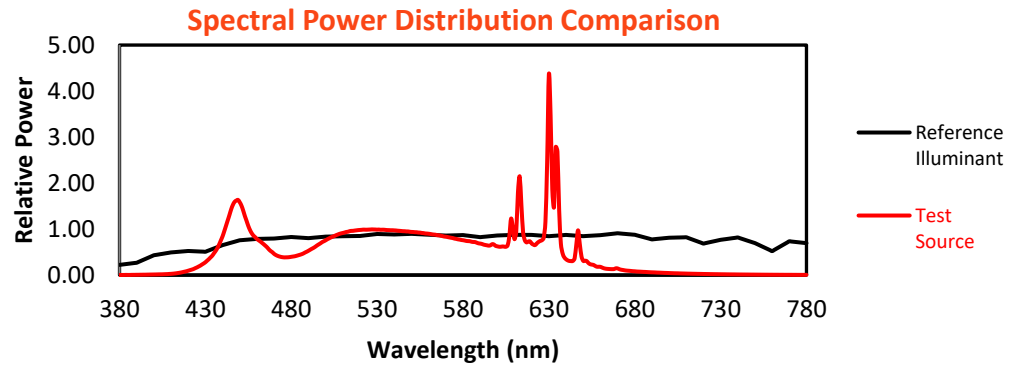
λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)
360	0	NR	490	121	NR	620	157	NR	750	2	NR	880	0	NR
365	0	NR	495	148	NR	625	170	NR	755	2	NR	885	0	NR
370	0	NR	500	173	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	194	NR	635	615	NR	765	1	NR	895	0	NR
380	0	NR	510	210	NR	640	79	NR	770	1	NR	900	0	NR
385	1	NR	515	220	NR	645	84	NR	775	1	NR	905	0	NR
390	1	NR	520	225	NR	650	71	NR	780	1	NR	910	0	NR
395	2	NR	525	227	NR	655	52	NR	785	1	NR	915	0	NR
400	3	NR	530	226	NR	660	41	NR	790	1	NR	920	0	NR
405	4	NR	535	225	NR	665	30	NR	795	1	NR	925	0	NR
410	6	NR	540	223	NR	670	33	NR	800	1	NR	930	0	NR
415	12	NR	545	219	NR	675	23	NR	805	0	NR	935	0	NR
420	22	NR	550	215	NR	680	19	NR	810	0	NR	940	0	NR
425	38	NR	555	212	NR	685	16	NR	815	0	NR	945	0	NR
430	64	NR	560	206	NR	690	14	NR	820	0	NR	950	0	NR
435	109	NR	565	199	NR	695	12	NR	825	0	NR	955	0	NR
440	193	NR	570	191	NR	700	10	NR	830	0	NR	960	0	NR
445	328	NR	575	182	NR	705	9	NR	835	0	NR	965	0	NR
450	363	NR	580	174	NR	710	7	NR	840	0	NR	970	0	NR
455	245	NR	585	166	NR	715	6	NR	845	0	NR	975	0	NR
460	180	NR	590	157	NR	720	5	NR	850	0	NR	980	0	NR
465	146	NR	595	147	NR	725	5	NR	855	0	NR	985	0	NR
470	106	NR	600	143	NR	730	4	NR	860	0	NR	990	0	NR
475	89	NR	605	141	NR	735	3	NR	865	0	NR	995	0	NR
480	91	NR	610	179	NR	740	3	NR	870	0	NR	1000	0	NR
485	101	NR	615	213	NR	745	3	NR	875	0	NR			

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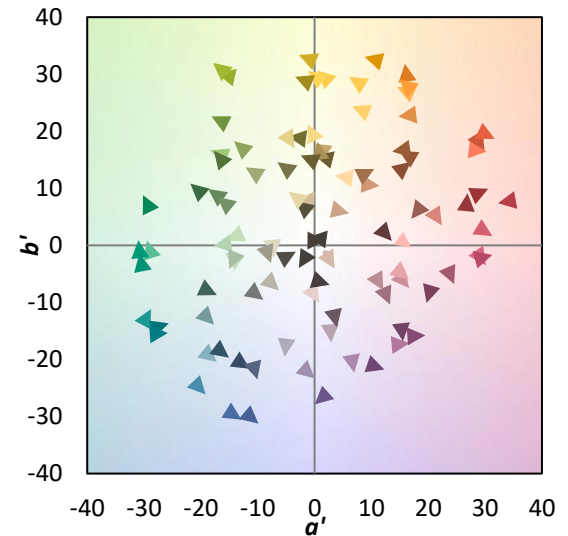
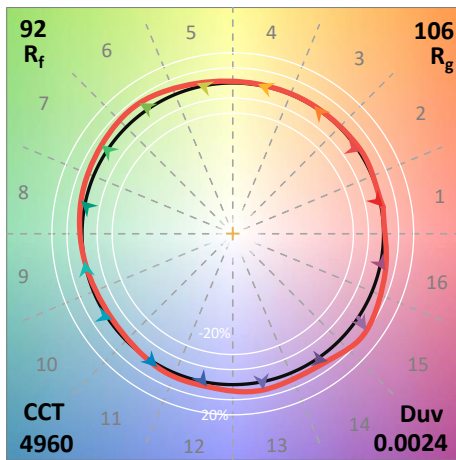
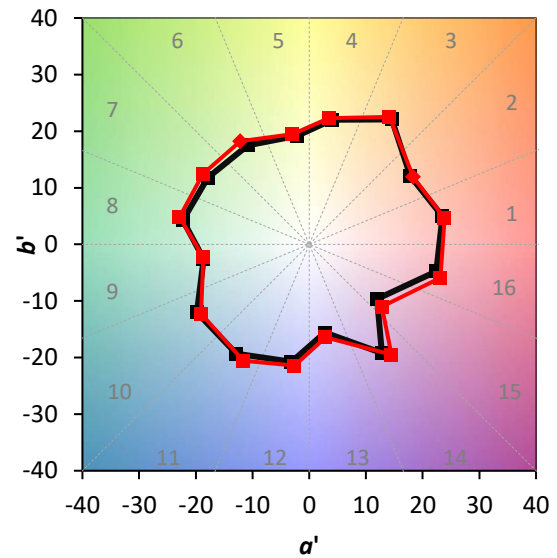
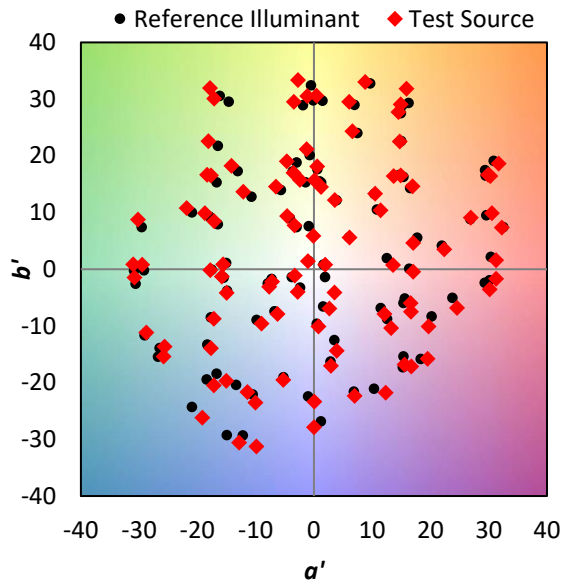
TM-30-18

Summary

$R_f = 92.2$
 $R_g = 105.8$
 $CIE R_a = 92.9$
 $R_9 = 81.7$

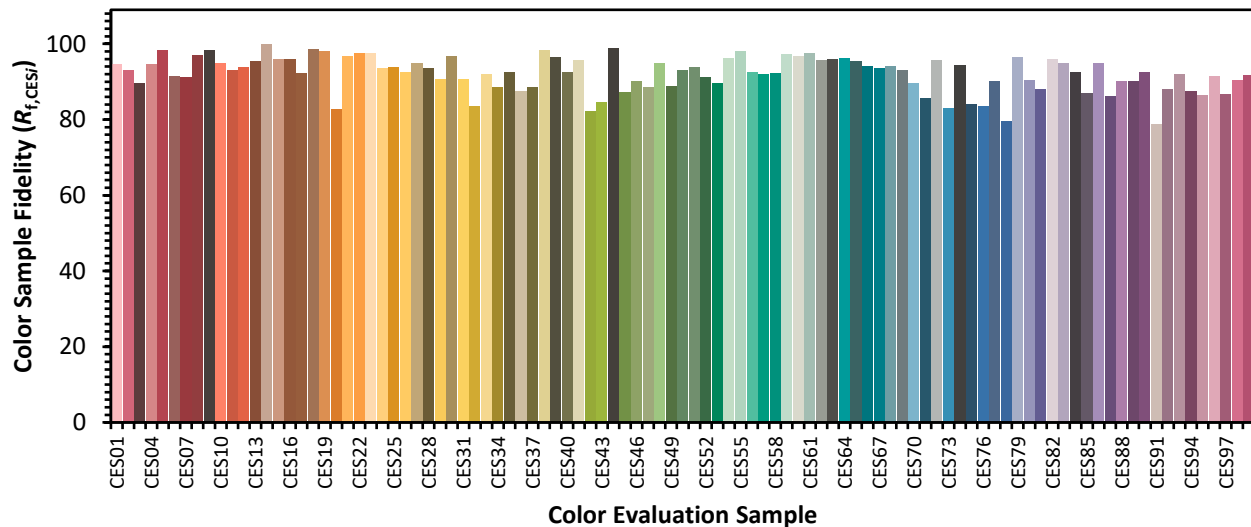


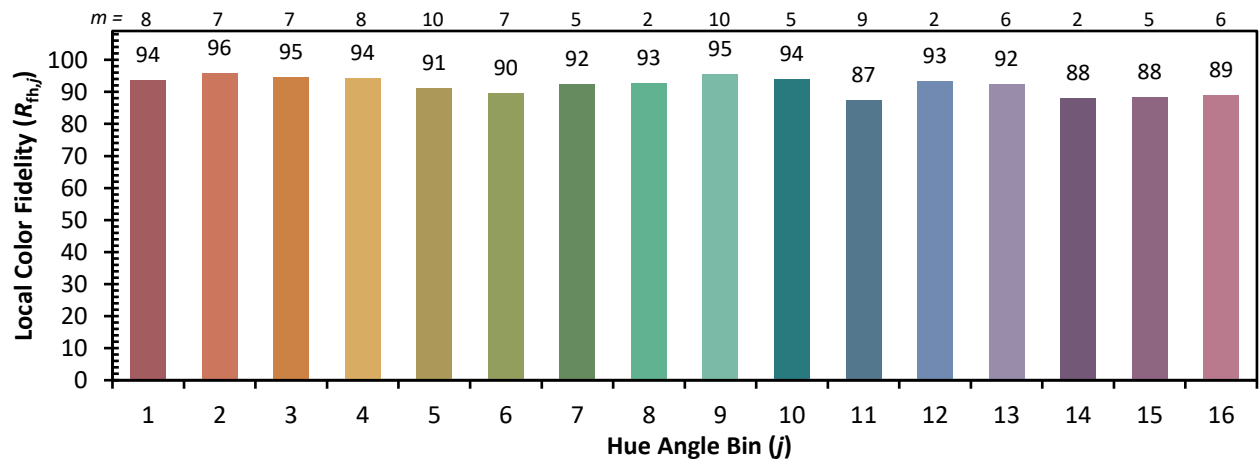
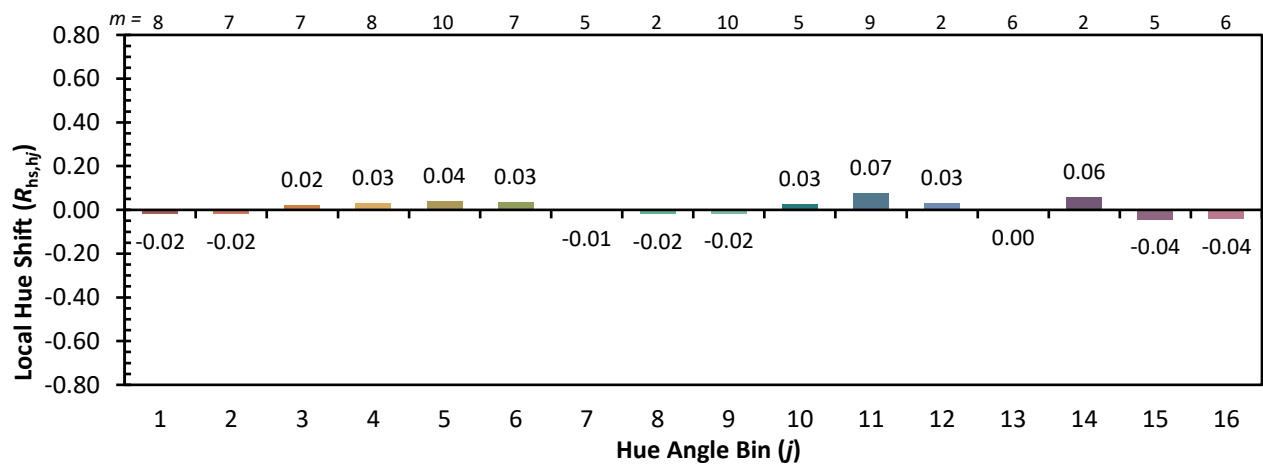
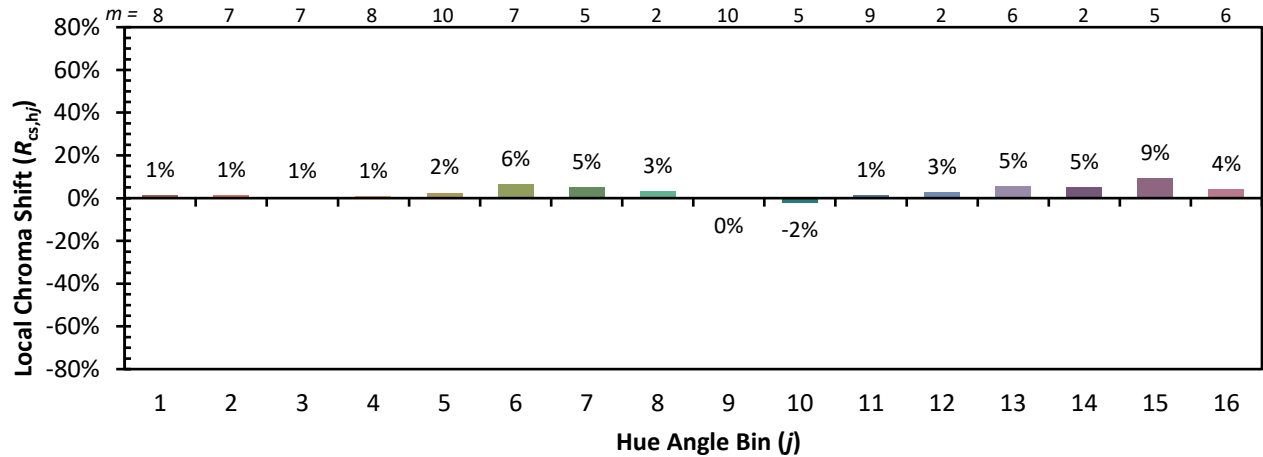
Color Vector Graphics



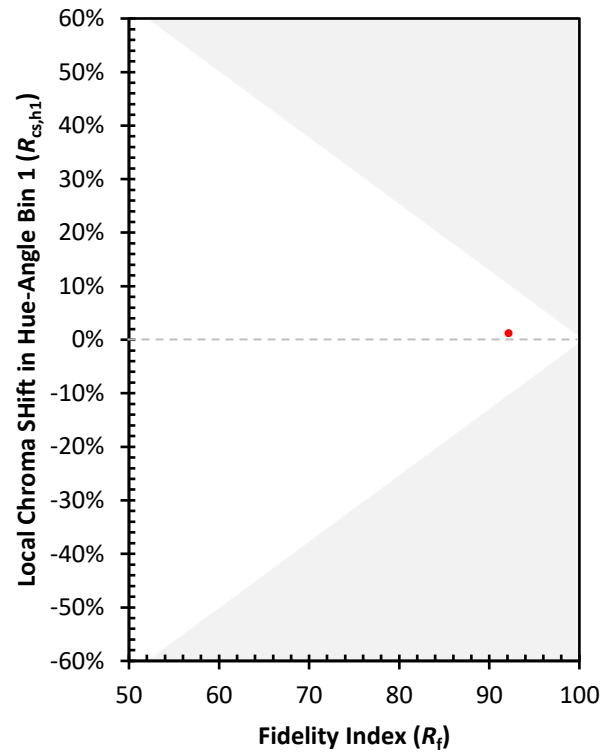
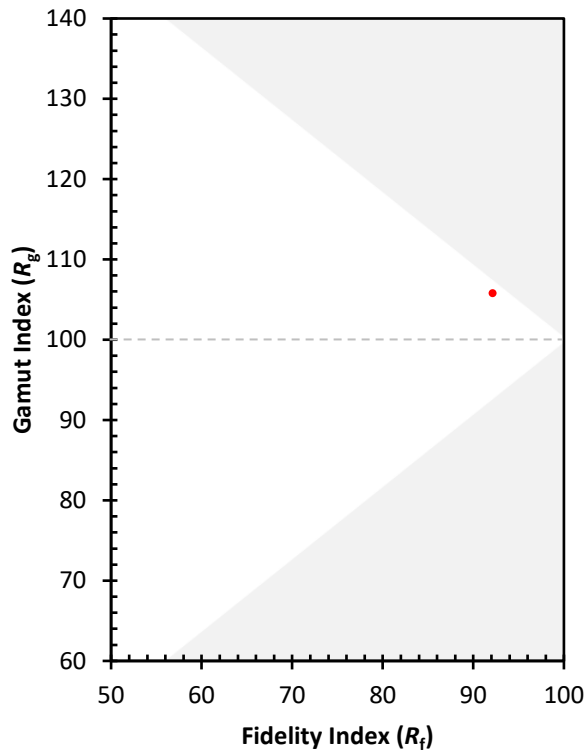
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 85	CES26 = 92	CES51 = 94	CES76 = 84
CES02 = 61	CES27 = 95	CES52 = 91	CES77 = 90
CES03 = 31	CES28 = 94	CES53 = 90	CES78 = 80
CES04 = 68	CES29 = 91	CES54 = 96	CES79 = 96
CES05 = 48	CES30 = 97	CES55 = 98	CES80 = 90
CES06 = 50	CES31 = 91	CES56 = 93	CES81 = 88
CES07 = 42	CES32 = 83	CES57 = 92	CES82 = 96
CES08 = 41	CES33 = 92	CES58 = 92	CES83 = 95
CES09 = 29	CES34 = 89	CES59 = 97	CES84 = 93
CES10 = 73	CES35 = 92	CES60 = 97	CES85 = 87
CES11 = 55	CES36 = 87	CES61 = 98	CES86 = 95
CES12 = 62	CES37 = 89	CES62 = 96	CES87 = 86
CES13 = 43	CES38 = 98	CES63 = 96	CES88 = 90
CES14 = 74	CES39 = 96	CES64 = 96	CES89 = 90
CES15 = 71	CES40 = 92	CES65 = 95	CES90 = 92
CES16 = 47	CES41 = 96	CES66 = 94	CES91 = 79
CES17 = 48	CES42 = 82	CES67 = 94	CES92 = 88
CES18 = 56	CES43 = 85	CES68 = 94	CES93 = 92
CES19 = 70	CES44 = 99	CES69 = 93	CES94 = 87
CES20 = 66	CES45 = 87	CES70 = 90	CES95 = 86
CES21 = 84	CES46 = 90	CES71 = 86	CES96 = 91
CES22 = 77	CES47 = 88	CES72 = 96	CES97 = 87
CES23 = 91	CES48 = 95	CES73 = 83	CES98 = 90
CES24 = 89	CES49 = 89	CES74 = 94	CES99 = 92
CES25 = 70	CES50 = 93	CES75 = 84	



Color Rendition by Hue-Angle Bin


Measure Comparisons



(END OF REPORT)