

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: P1046658

Luminaire Tested: FMNL809FS5-(black trim)-930

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: P1046658
Test Lab: Cooper lighting solutions
Issue Date: 07/03/2025
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: FMNL809FS5-(black trim)-930
Description: HALO 8 inch 90 CRI COLOR SELECTABLE flush mount Black Trim FIXTURE with night light
Light Source: 3000K CCT, 90 CRI LEDS
Ballast/Driver: -

Summary

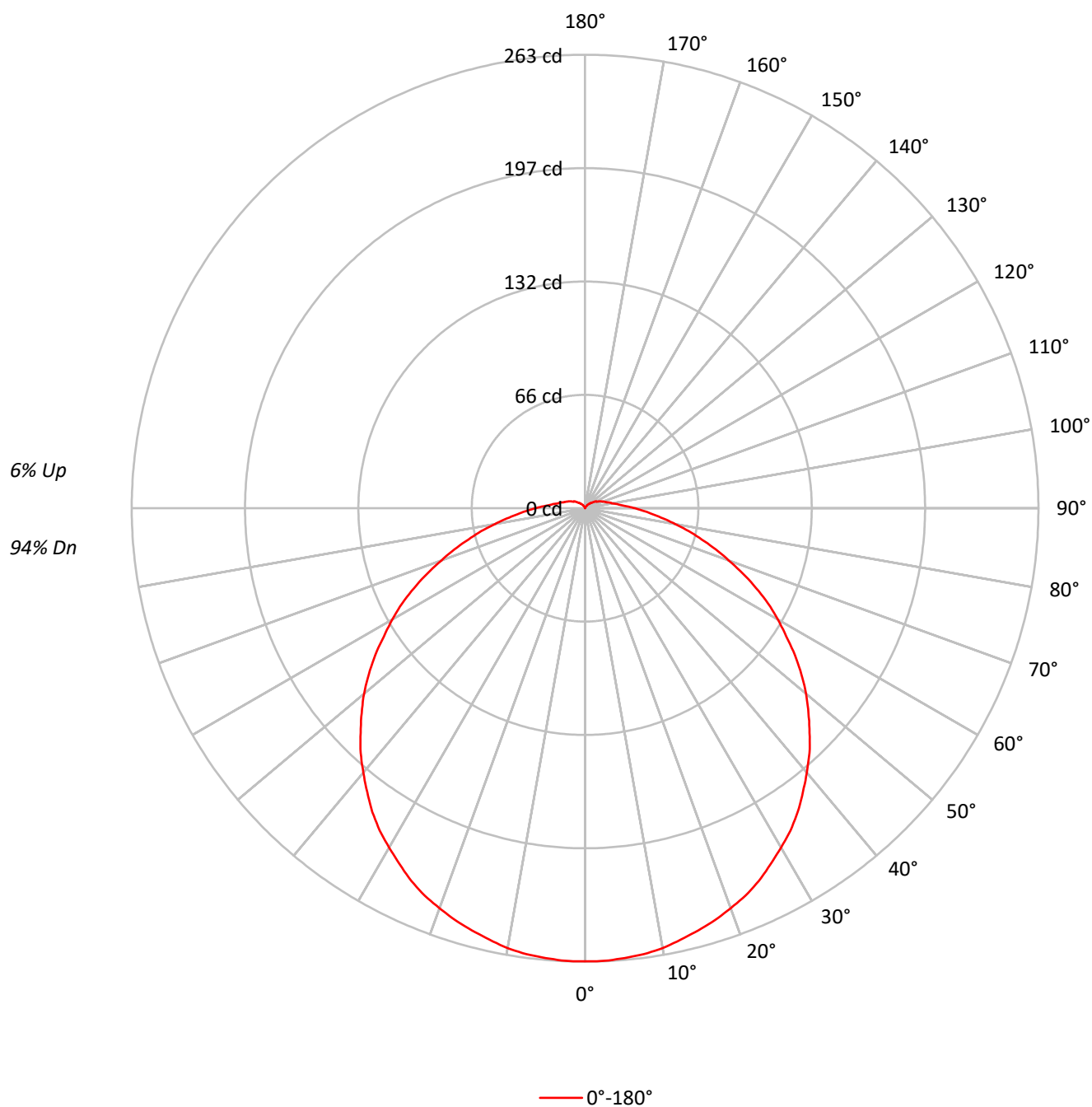
Lumens per Lamp: N/A
Luminaire Lumens: 899.9 lumens
Efficiency: N/A
Efficacy: 88.2 lumens/watt
Spacing Criteria (0/90/45): 1.29 / 1.29 / 1.41
Luminous Opening: Circular (Dia: 0.7' x H: 0')
CIE Type: Direct

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

TEST NUMBER: P1046658
CATALOG NUMBER: FMNL809FS5-(black trim)-930

Luminous Intensity Polar Plot



TEST NUMBER: P1046658

CATALOG NUMBER: FMNL809FS5-(black trim)-930

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	

TEST NUMBER: P1046658

CATALOG NUMBER: FMNL809FS5-(black trim)-930

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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CATALOG NUMBER: FMNL809FS5-(black trim)-930

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

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

Report Prepared for

Cooper Lighting Solutions

Halo Home

Report Number: SP1-2506-468-2

Test Date: 07/08/2025

Luminaire Tested: FMNL809FS5-3000K

Data in this report applies to families of products including FMNL809FS5-3000K

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

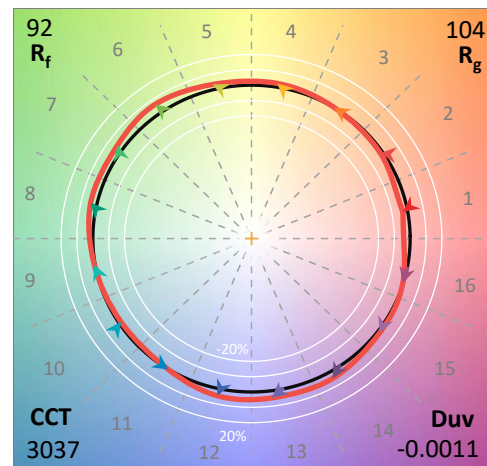
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2506-468-2
 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: **FMNL809F55-3000K**
 Description: HALO FLUSH MOUNT NIGHT LIGHT 8 INCH

Spectral Parameters

CCT (K): 3037
 CIE u' : 0.2497
 CIE v' : 0.5192
 Duv: -0.0011
 CIE x: 0.4328
 CIE y: 0.4000
 CIE z: 0.1672
 Peak Wavelength (nm): 630
 Dominant Wavelength (nm): 583
 Purity: 49.97134
 R_f: 91.9
 R_g: 103.5

CRI (Ra): 95.9
 R1: 99.8
 R2: 97.8
 R3: 94.2
 R4: 94.3
 R5: 98.4
 R6: 96.9
 R7: 94.7
 R8: 91.2
 R9: 76.6
 R10: 93.1
 R11: 91.5
 R12: 90.1
 R13: 99.2
 R14: 95.2
 R15: 96.1



Test Conditions

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

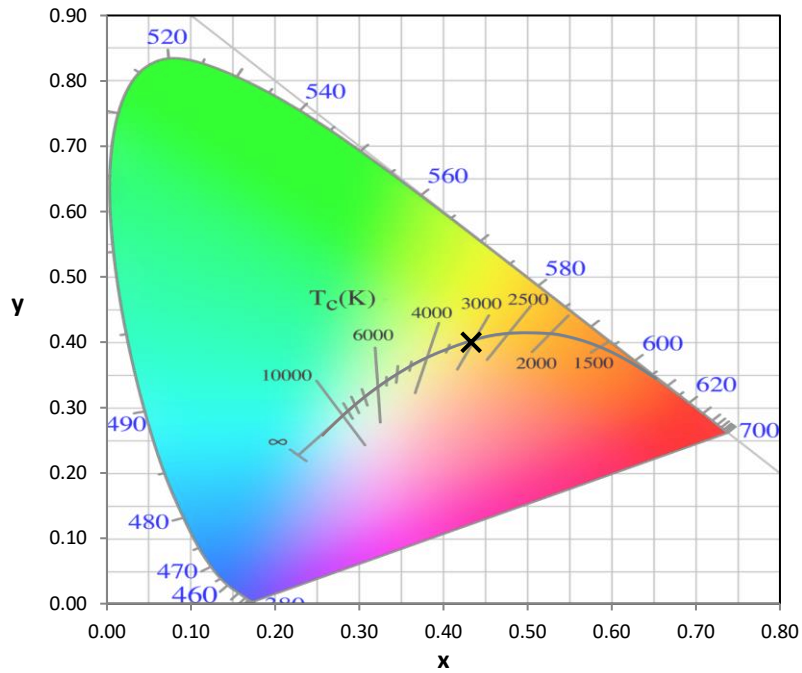
REPORT NUMBER: SP1-2506-468-2

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

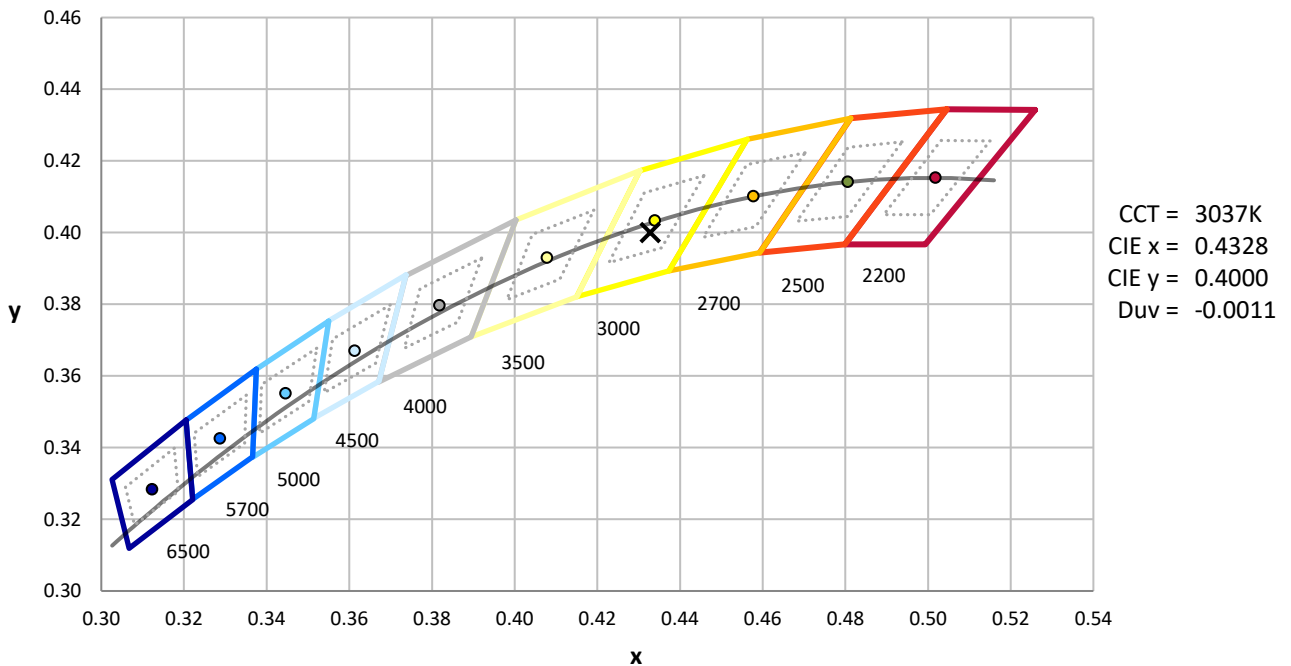
Sample Number	Condition	Description
P2506-468-LM.1	Good	HALO FLUSH MOUNT NIGHT LIGHT 8 INCH

REPORT NUMBER: SP1-2506-468-2

CIE 1931 Chromaticity Diagram



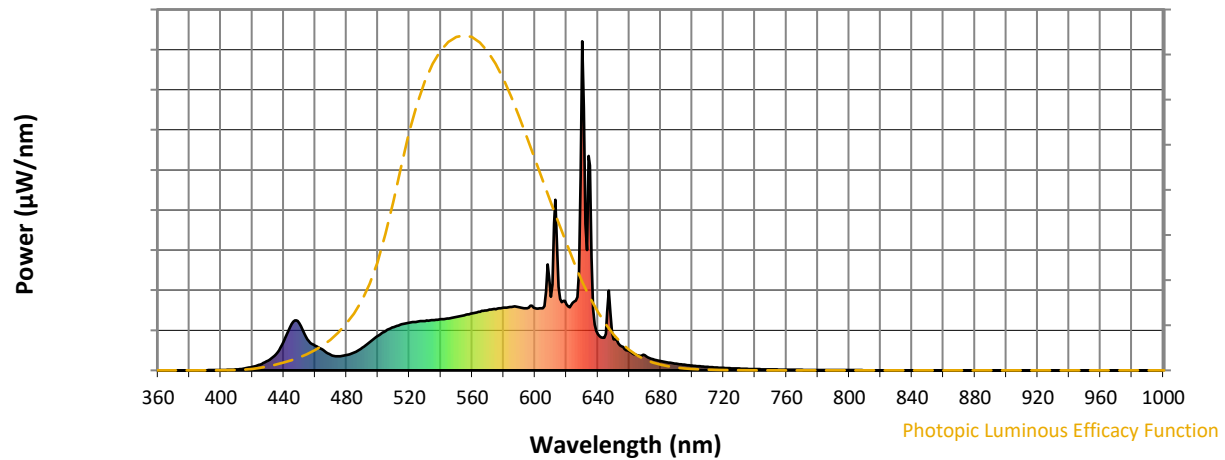
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

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Photopic Flux vs. Wavelength

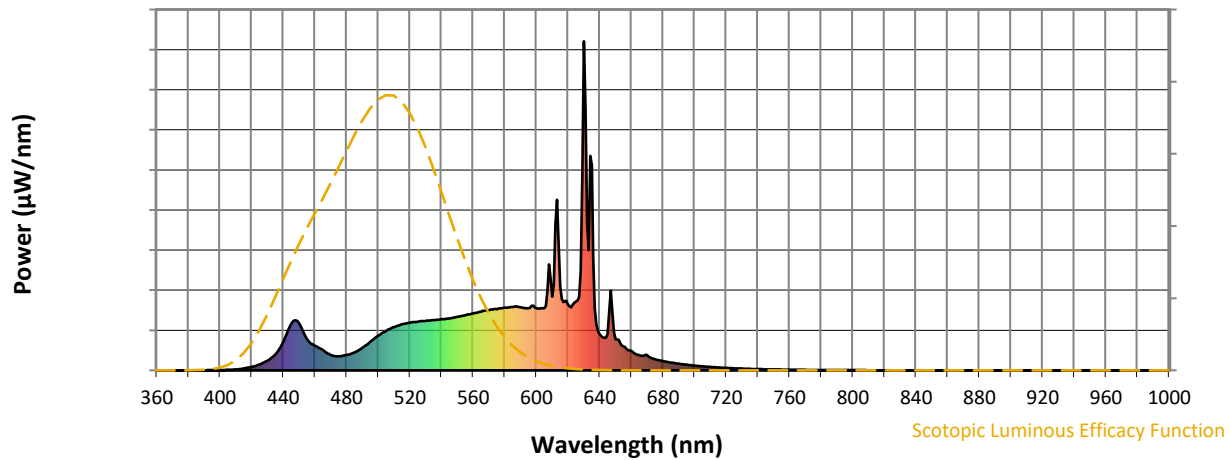


Photopic Lumens: NR

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	69	NR	620	200	NR	750	3	NR	880	0	NR
365	0	NR	495	87	NR	625	209	NR	755	2	NR	885	0	NR
370	0	NR	500	105	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	120	NR	635	623	NR	765	2	NR	895	0	NR
380	0	NR	510	132	NR	640	110	NR	770	2	NR	900	0	NR
385	0	NR	515	140	NR	645	111	NR	775	1	NR	905	0	NR
390	0	NR	520	145	NR	650	94	NR	780	1	NR	910	0	NR
395	1	NR	525	148	NR	655	73	NR	785	1	NR	915	0	NR
400	1	NR	530	150	NR	660	59	NR	790	1	NR	920	0	NR
405	2	NR	535	152	NR	665	46	NR	795	1	NR	925	0	NR
410	3	NR	540	155	NR	670	46	NR	800	1	NR	930	0	NR
415	6	NR	545	158	NR	675	34	NR	805	1	NR	935	0	NR
420	11	NR	550	162	NR	680	28	NR	810	1	NR	940	0	NR
425	18	NR	555	168	NR	685	24	NR	815	0	NR	945	0	NR
430	29	NR	560	173	NR	690	20	NR	820	0	NR	950	0	NR
435	49	NR	565	178	NR	695	17	NR	825	0	NR	955	0	NR
440	88	NR	570	183	NR	700	14	NR	830	0	NR	960	0	NR
445	141	NR	575	186	NR	705	12	NR	835	0	NR	965	0	NR
450	143	NR	580	191	NR	710	10	NR	840	0	NR	970	0	NR
455	95	NR	585	193	NR	715	9	NR	845	0	NR	975	0	NR
460	75	NR	590	192	NR	720	7	NR	850	0	NR	980	0	NR
465	62	NR	595	189	NR	725	6	NR	855	0	NR	985	0	NR
470	46	NR	600	189	NR	730	5	NR	860	0	NR	990	0	NR
475	43	NR	605	188	NR	735	5	NR	865	0	NR	995	0	NR
480	47	NR	610	223	NR	740	4	NR	870	0	NR	1000	0	NR
485	54	NR	615	253	NR	745	3	NR	875	0	NR			

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Scotopic Flux vs. Wavelength



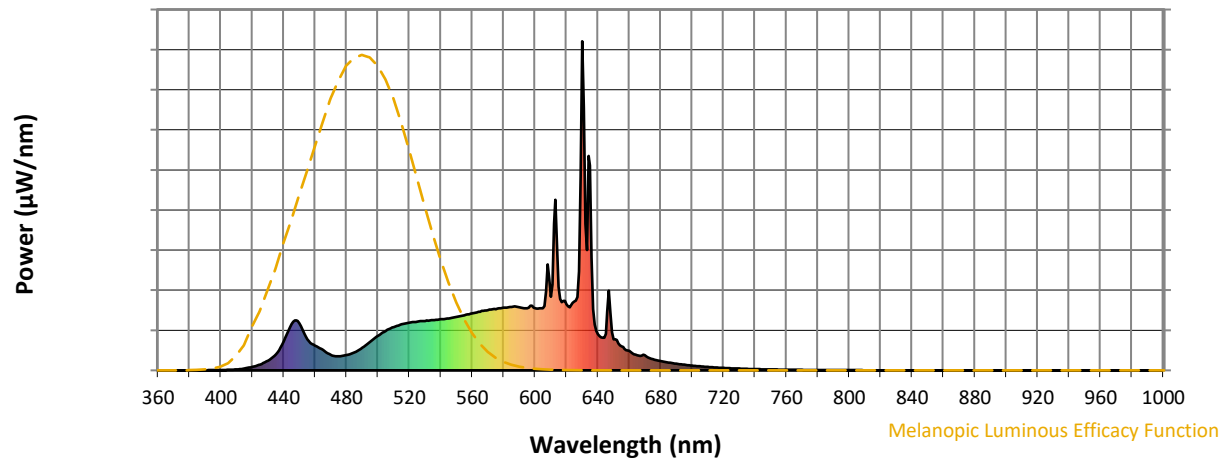
Scotopic Lumens: NR

S/P: 1.45

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	69	NR	620	200	NR	750	3	NR	880	0	NR
365	0	NR	495	87	NR	625	209	NR	755	2	NR	885	0	NR
370	0	NR	500	105	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	120	NR	635	623	NR	765	2	NR	895	0	NR
380	0	NR	510	132	NR	640	110	NR	770	2	NR	900	0	NR
385	0	NR	515	140	NR	645	111	NR	775	1	NR	905	0	NR
390	0	NR	520	145	NR	650	94	NR	780	1	NR	910	0	NR
395	1	NR	525	148	NR	655	73	NR	785	1	NR	915	0	NR
400	1	NR	530	150	NR	660	59	NR	790	1	NR	920	0	NR
405	2	NR	535	152	NR	665	46	NR	795	1	NR	925	0	NR
410	3	NR	540	155	NR	670	46	NR	800	1	NR	930	0	NR
415	6	NR	545	158	NR	675	34	NR	805	1	NR	935	0	NR
420	11	NR	550	162	NR	680	28	NR	810	1	NR	940	0	NR
425	18	NR	555	168	NR	685	24	NR	815	0	NR	945	0	NR
430	29	NR	560	173	NR	690	20	NR	820	0	NR	950	0	NR
435	49	NR	565	178	NR	695	17	NR	825	0	NR	955	0	NR
440	88	NR	570	183	NR	700	14	NR	830	0	NR	960	0	NR
445	141	NR	575	186	NR	705	12	NR	835	0	NR	965	0	NR
450	143	NR	580	191	NR	710	10	NR	840	0	NR	970	0	NR
455	95	NR	585	193	NR	715	9	NR	845	0	NR	975	0	NR
460	75	NR	590	192	NR	720	7	NR	850	0	NR	980	0	NR
465	62	NR	595	189	NR	725	6	NR	855	0	NR	985	0	NR
470	46	NR	600	189	NR	730	5	NR	860	0	NR	990	0	NR
475	43	NR	605	188	NR	735	5	NR	865	0	NR	995	0	NR
480	47	NR	610	223	NR	740	4	NR	870	0	NR	1000	0	NR
485	54	NR	615	253	NR	745	3	NR	875	0	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.82

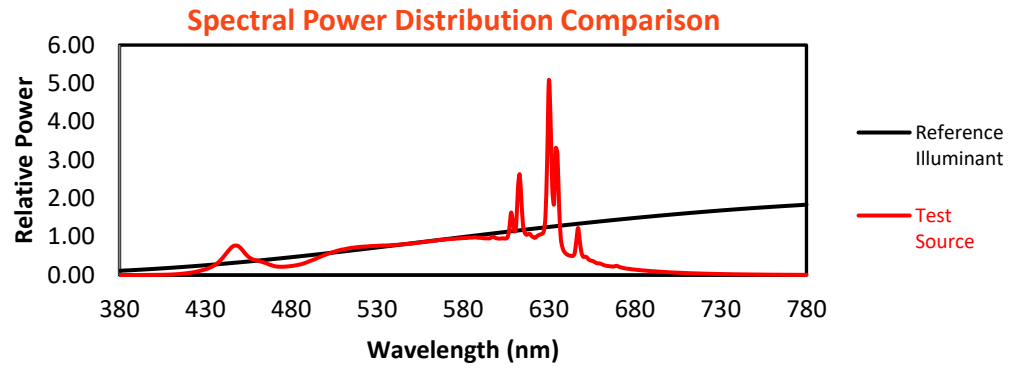
λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)	λ (nm)	Power $\text{W}^{\wedge}/\text{nm}$	Lumens (ϕ/nm)
360	0	NR	490	69	NR	620	200	NR	750	3	NR	880	0	NR
365	0	NR	495	87	NR	625	209	NR	755	2	NR	885	0	NR
370	0	NR	500	105	NR	630	1000	NR	760	2	NR	890	0	NR
375	0	NR	505	120	NR	635	623	NR	765	2	NR	895	0	NR
380	0	NR	510	132	NR	640	110	NR	770	2	NR	900	0	NR
385	0	NR	515	140	NR	645	111	NR	775	1	NR	905	0	NR
390	0	NR	520	145	NR	650	94	NR	780	1	NR	910	0	NR
395	1	NR	525	148	NR	655	73	NR	785	1	NR	915	0	NR
400	1	NR	530	150	NR	660	59	NR	790	1	NR	920	0	NR
405	2	NR	535	152	NR	665	46	NR	795	1	NR	925	0	NR
410	3	NR	540	155	NR	670	46	NR	800	1	NR	930	0	NR
415	6	NR	545	158	NR	675	34	NR	805	1	NR	935	0	NR
420	11	NR	550	162	NR	680	28	NR	810	1	NR	940	0	NR
425	18	NR	555	168	NR	685	24	NR	815	0	NR	945	0	NR
430	29	NR	560	173	NR	690	20	NR	820	0	NR	950	0	NR
435	49	NR	565	178	NR	695	17	NR	825	0	NR	955	0	NR
440	88	NR	570	183	NR	700	14	NR	830	0	NR	960	0	NR
445	141	NR	575	186	NR	705	12	NR	835	0	NR	965	0	NR
450	143	NR	580	191	NR	710	10	NR	840	0	NR	970	0	NR
455	95	NR	585	193	NR	715	9	NR	845	0	NR	975	0	NR
460	75	NR	590	192	NR	720	7	NR	850	0	NR	980	0	NR
465	62	NR	595	189	NR	725	6	NR	855	0	NR	985	0	NR
470	46	NR	600	189	NR	730	5	NR	860	0	NR	990	0	NR
475	43	NR	605	188	NR	735	5	NR	865	0	NR	995	0	NR
480	47	NR	610	223	NR	740	4	NR	870	0	NR	1000	0	NR
485	54	NR	615	253	NR	745	3	NR	875	0	NR			

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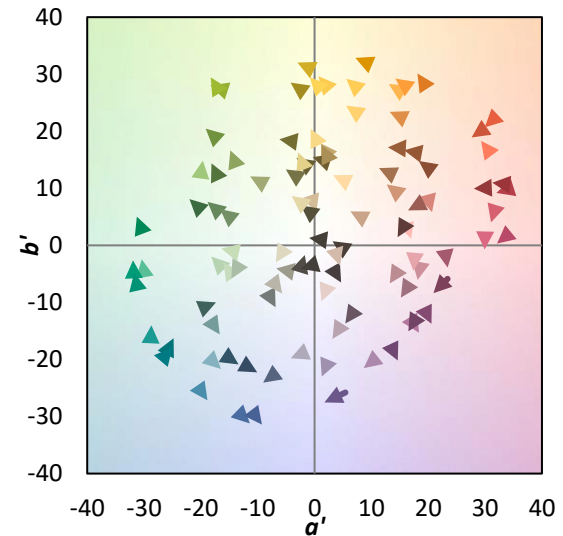
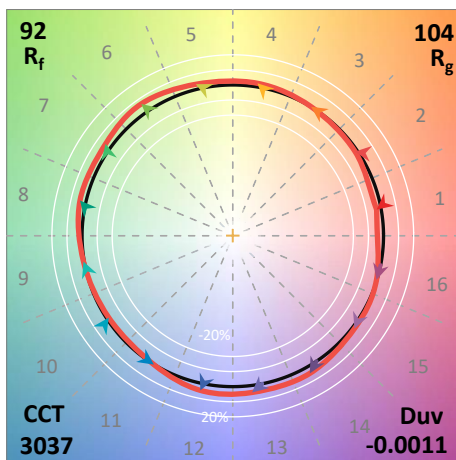
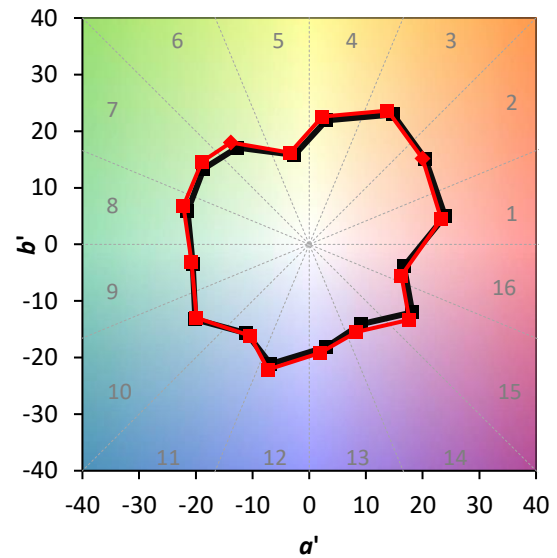
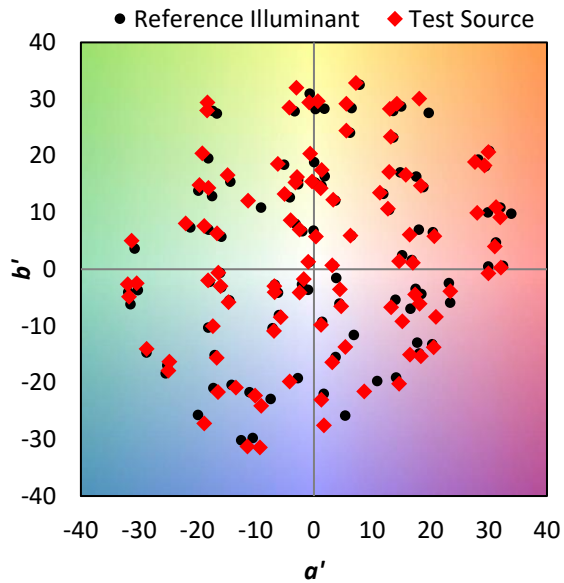
TM-30-18

Summary

$R_f = 91.9$
 $R_g = 103.5$
 $CIE R_a = 95.9$
 $R_9 = 76.6$

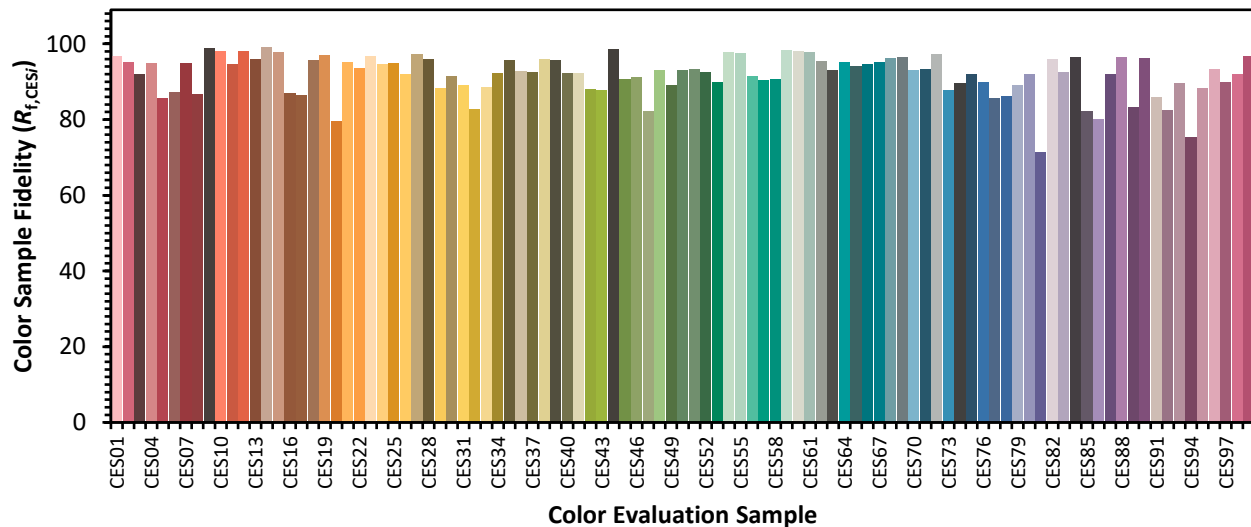


Color Vector Graphics

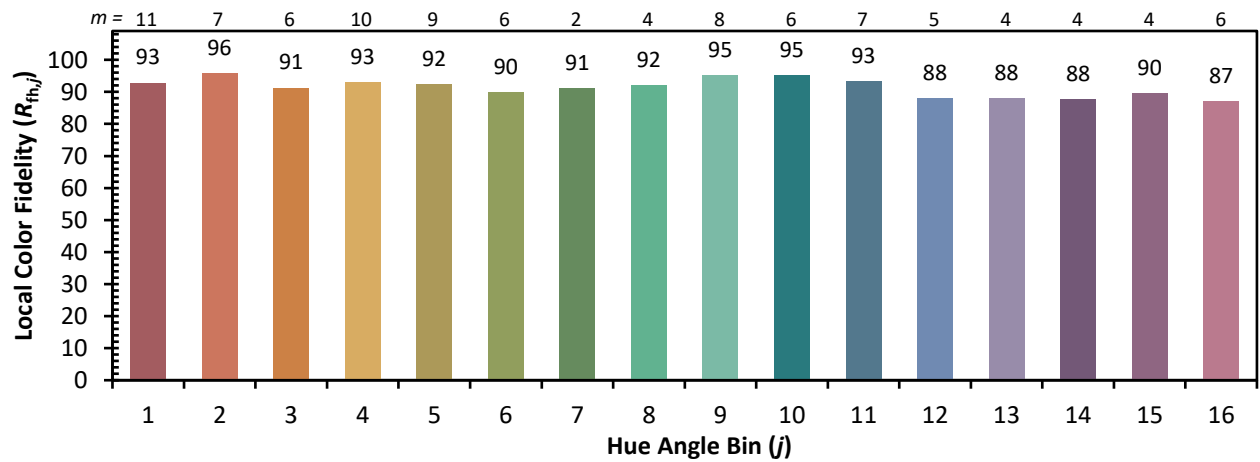
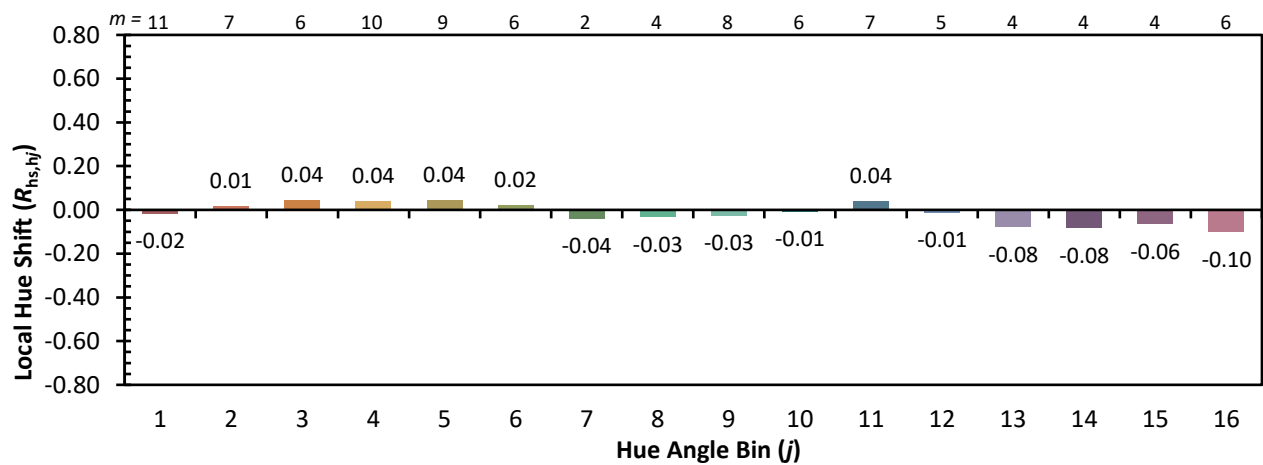
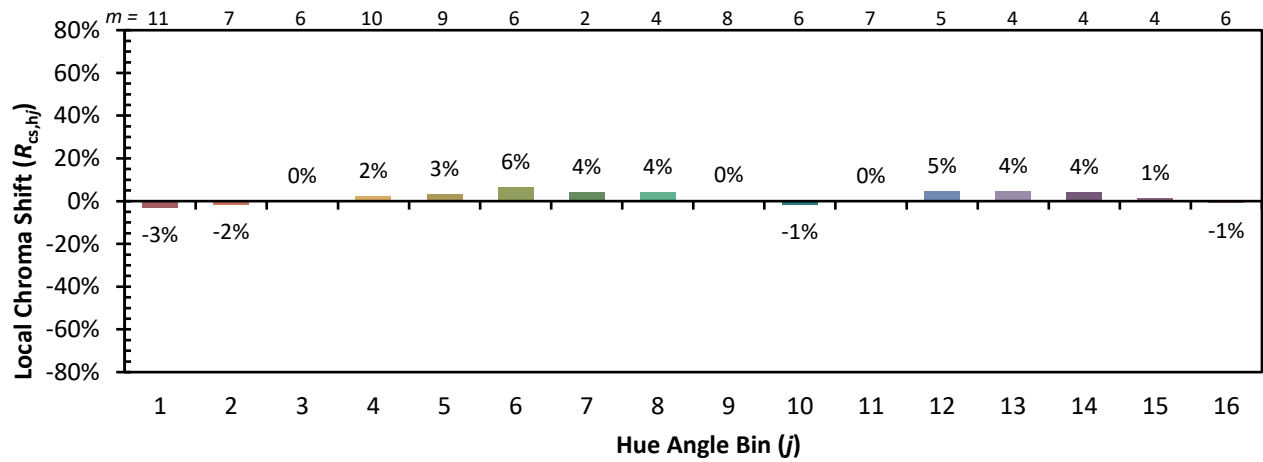


Individual Sample Fidelity Index ($R_{f,i}$)

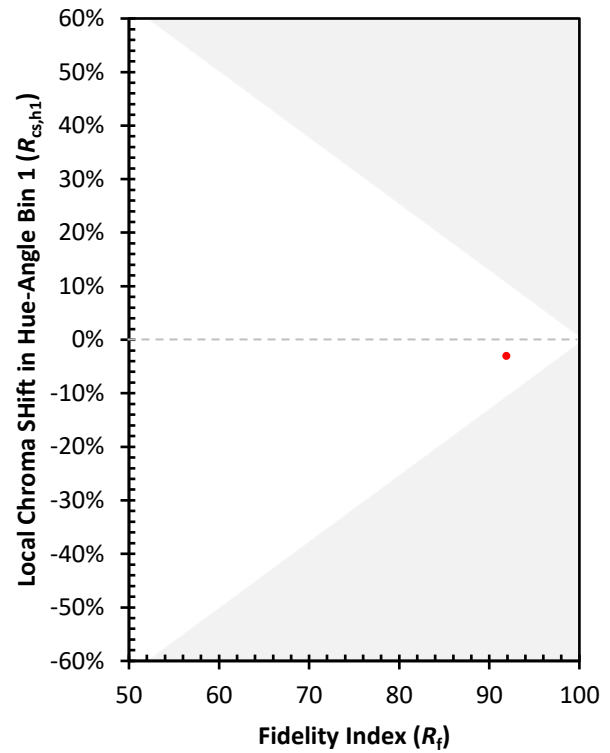
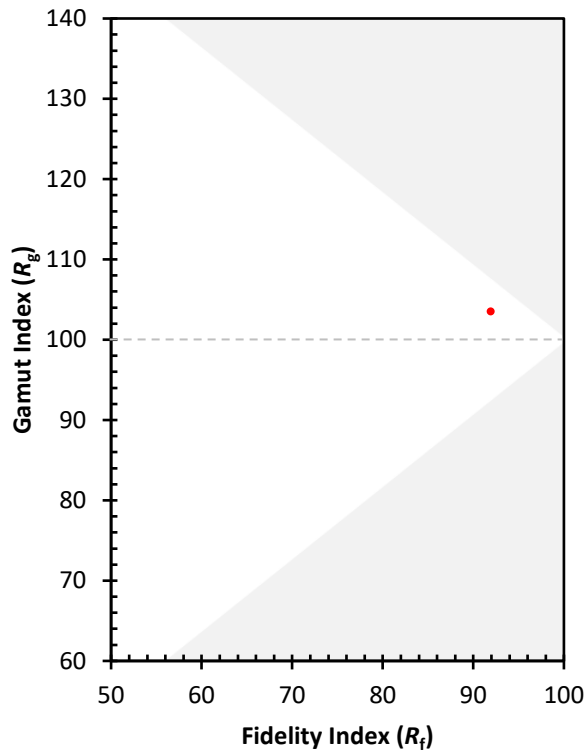
CES01 = 86	CES26 = 92	CES51 = 93	CES76 = 90
CES02 = 63	CES27 = 97	CES52 = 92	CES77 = 86
CES03 = 32	CES28 = 96	CES53 = 90	CES78 = 86
CES04 = 70	CES29 = 88	CES54 = 98	CES79 = 89
CES05 = 51	CES30 = 91	CES55 = 97	CES80 = 92
CES06 = 51	CES31 = 89	CES56 = 91	CES81 = 71
CES07 = 44	CES32 = 83	CES57 = 90	CES82 = 96
CES08 = 42	CES33 = 88	CES58 = 91	CES83 = 92
CES09 = 29	CES34 = 92	CES59 = 98	CES84 = 97
CES10 = 76	CES35 = 96	CES60 = 98	CES85 = 82
CES11 = 58	CES36 = 93	CES61 = 98	CES86 = 80
CES12 = 65	CES37 = 92	CES62 = 95	CES87 = 92
CES13 = 44	CES38 = 96	CES63 = 93	CES88 = 96
CES14 = 74	CES39 = 96	CES64 = 95	CES89 = 83
CES15 = 72	CES40 = 92	CES65 = 94	CES90 = 96
CES16 = 48	CES41 = 92	CES66 = 95	CES91 = 86
CES17 = 50	CES42 = 88	CES67 = 95	CES92 = 82
CES18 = 57	CES43 = 88	CES68 = 96	CES93 = 90
CES19 = 72	CES44 = 99	CES69 = 97	CES94 = 75
CES20 = 67	CES45 = 91	CES70 = 93	CES95 = 88
CES21 = 86	CES46 = 91	CES71 = 93	CES96 = 93
CES22 = 79	CES47 = 82	CES72 = 97	CES97 = 90
CES23 = 91	CES48 = 93	CES73 = 88	CES98 = 92
CES24 = 90	CES49 = 89	CES74 = 90	CES99 = 97
CES25 = 72	CES50 = 93	CES75 = 92	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)