

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions

Brand: iO LED

Report Number: G2-2312-259-1

Luminaire Tested: CS-SL-9SCT-120-ID-UNV-W-SA-STD-1F-(Low-2700K)

Issue Date: 8/14/2024

Test Information

Test Method: LM-79-2019
Report Number: G2-2312-259-1
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 8/14/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: iO LED
Catalog Number: CS-SL-9SCT-120-ID-UNV-W-SA-STD-1F-(Low-2700K)
Description: iO CovSelect LED LINEAR LUMINAIRE, 1 FOOT, HIGH OUTPUT
ADJUSTED TO 2700K
Light Source: 2700 CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 351.1 lumens
Efficiency: N/A
Efficacy: 100.3 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.19 / 1.3
Luminous Opening: Rectangular w/ Sides (W: 0.08' x L: 1' x H: 0.01')
CIE Type: Direct

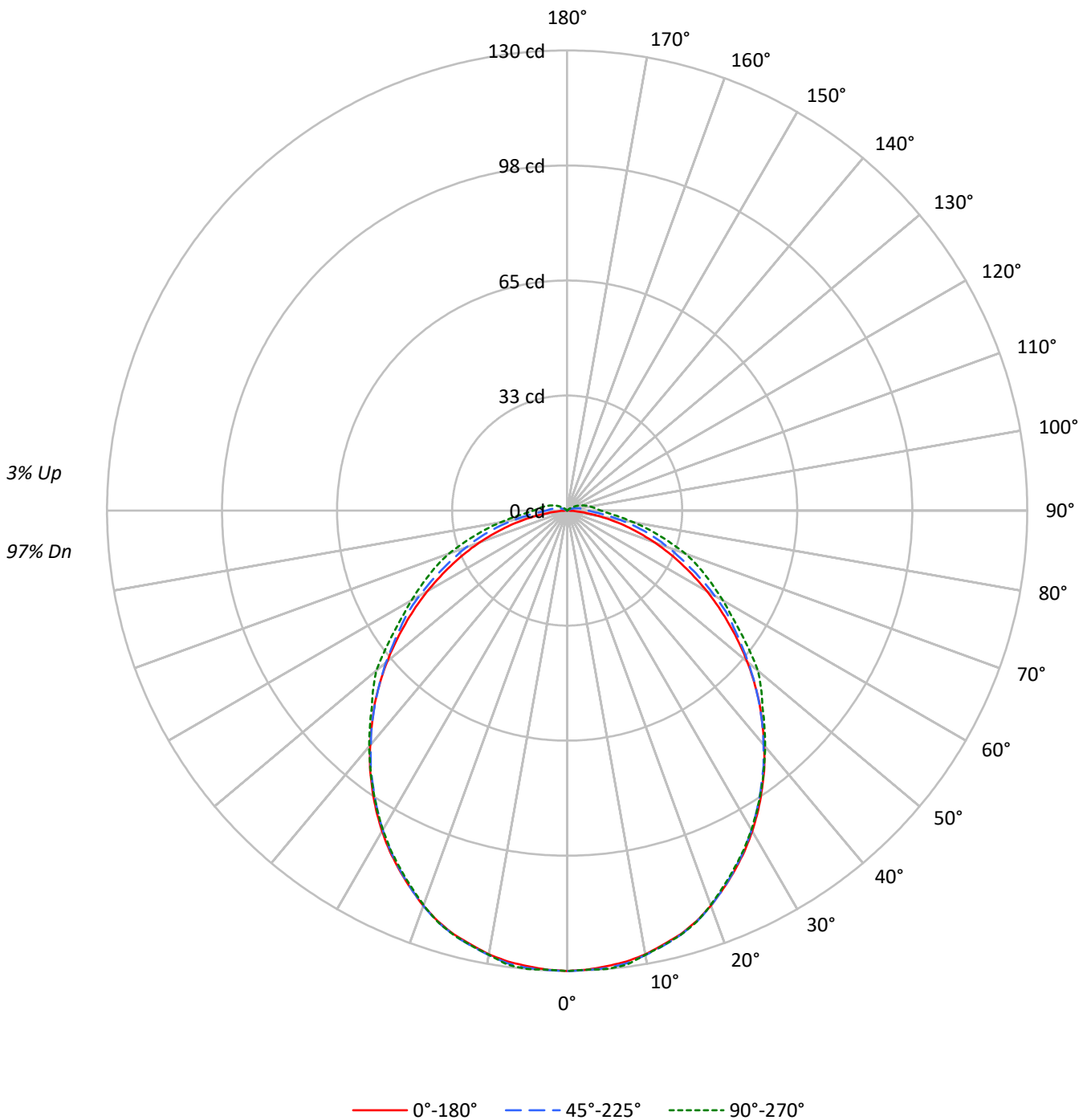
Input Watts (W): 3.5
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9428
Total Harmonic Distortion (THDi): 0.075
Frequency (hertz): 60
Stabilization Time: 0.333 HR
Operation Time: 3 HR
Ambient Temperature (°C): NR
Test Distance: 24 FT



TEST NUMBER: G2-2312-259-1

CATALOG NUMBER: CS-SL-9SCT-120-ID-UNV-W-SA-STD-1F-(Low-2700K)

Luminous Intensity Polar Plot



TEST NUMBER: G2-2312-259-1

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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	50	30	10	0	
RCR																						
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97				
1	108	103	99	95	105	101	97	93	96	93	90	91	89	86	87	85	83	81				
2	98	90	83	77	95	88	82	76	84	79	74	80	76	72	77	73	70	68				
3	90	79	71	65	87	77	70	64	74	68	62	71	65	61	68	63	60	57				
4	82	70	62	55	80	69	61	54	66	59	53	63	57	52	61	56	51	49				
5	76	63	54	47	73	62	53	47	59	52	46	57	51	46	55	49	45	43				
6	70	57	48	42	68	56	47	41	54	46	41	52	45	40	50	44	40	37				
7	65	52	43	37	63	51	42	37	49	41	36	47	41	36	46	40	35	33				
8	61	47	39	33	59	46	38	33	45	38	32	43	37	32	42	36	32	30				
9	57	43	35	30	55	43	35	30	41	34	29	40	34	29	39	33	29	27				
10	53	40	32	27	52	39	32	27	38	31	27	37	31	26	36	30	26	24				

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	16805	16805	16805
5°	16737	16677	16674
10°	16666	16445	16349
15°	16522	16180	16057
20°	16268	15780	15593
25°	15899	15266	15029
30°	15508	14727	14481
35°	15028	14113	13876
40°	14476	13469	13277
45°	13884	12770	12665
50°	13179	12048	12313
55°	12382	11371	11408
60°	11571	10658	10788
65°	10643	9788	10364
70°	9619	9060	9980
75°	8359	8383	9120
80°	6602	7327	8270
85°	3973	6510	7871

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 13884 cd/sqm



TEST NUMBER: G2-2312-259-1

CATALOG NUMBER: CS-SL-9SCT-120-ID-UNV-W-SA-STD-1F-(Low-2700K)

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	12.3	3.5
10°-20°	34.9	9.9
20°-30°	51.5	14.7
30°-40°	59.8	17.0
40°-50°	59.5	16.9
50°-60°	51.6	14.7
60°-70°	38.7	11.0
70°-80°	23.8	6.8
80°-90°	10.0	2.8
90°-100°	4.7	1.3
100°-110°	2.7	0.8
110°-120°	1.3	0.4
120°-130°	0.4	0.1
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	98.7	28.1
0°-40°	158.5	45.1
0°-60°	269.5	76.8
0°-90°	342.0	97.4
90°-120°	8.7	2.5
90°-150°	9.1	2.6
90°-180°	9.0	2.6
0°-180°	351.1	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	130	130	130	130	130	
5°	129	129	130	130	130	12
15°	124	124	124	124	124	35
25°	112	112	112	112	112	52
35°	96	95	96	96	96	60
45°	77	76	77	78	78	59
55°	56	56	57	60	60	50
65°	36	36	39	42	43	35
75°	17	19	23	26	27	19
85°	3	6	9	12	13	4
90°	0	2	6	8	10	0
95°	0	1	5	7	8	0
105°	0	0	3	5	5	0
115°	0	0	1	2	3	0
125°	0	0	0	1	1	0
135°	0	0	0	0	0	0
145°	0	0	0	0	0	0
155°	0	0	0	0	0	0
165°	0	0	0	0	0	0
175°	0	0	0	0	0	0
180°	0	0	0	0	0	0



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CATALOG NUMBER: CS-SL-9SCT-120-ID-UNV-W-SA-STD-1F-(Low-2700K)

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	130.1	130.1	130.1	130.1	130.1
2.5°	129.8	129.4	129.9	129.7	129.8
5°	129.2	129.1	129.7	129.8	130.0
7.5°	128.5	128.3	129.0	129.1	129.4
10°	127.3	127.0	127.5	127.4	127.4
12.5°	125.6	125.4	125.9	125.7	125.8
15°	123.9	123.5	124.1	124.0	124.1
17.5°	121.6	121.3	121.8	121.6	121.8
20°	118.8	118.4	118.8	118.6	118.6
22.5°	115.5	115.2	115.5	115.2	115.1
25°	112.1	111.7	111.9	111.7	111.6
27.5°	108.5	108.0	108.2	108.1	108.0
30°	104.6	104.0	104.2	104.2	104.1
32.5°	100.4	99.7	99.9	100.1	100.0
35°	96.0	95.2	95.5	95.8	95.7
37.5°	91.5	90.8	91.1	91.3	91.4
40°	86.6	86.1	86.3	86.9	87.0
42.5°	81.6	81.2	81.6	82.4	82.5
45°	76.8	76.2	76.6	77.7	78.0
47.5°	71.6	71.1	71.7	73.2	74.3
50°	66.4	66.0	66.8	69.4	70.4
52.5°	61.1	60.8	61.9	65.1	64.9
55°	55.8	55.6	57.4	59.6	59.7
57.5°	50.7	50.6	53.2	54.5	54.9
60°	45.6	45.7	48.1	49.8	50.8
62.5°	40.5	40.8	43.3	45.6	46.8
65°	35.6	36.1	38.6	41.7	43.0
67.5°	30.9	31.7	34.3	38.0	39.4
70°	26.2	27.4	30.3	34.3	35.5
72.5°	21.7	23.1	26.5	30.1	30.9
75°	17.4	18.9	22.8	25.8	26.8
77.5°	13.3	15.0	18.9	22.0	22.8
80°	9.4	11.5	15.2	18.2	19.0
82.5°	5.9	8.3	12.0	14.9	15.7
85°	3.0	5.5	9.2	12.0	12.9
87.5°	0.9	3.3	7.0	9.8	10.9
90°	0.0	2.2	5.9	8.5	9.5
92.5°	0.0	1.8	5.2	7.7	8.6
95°	0.0	1.4	4.6	7.0	7.9
97.5°	0.0	1.1	4.1	6.4	7.2
100°	0.0	0.8	3.6	5.8	6.6
102.5°	0.0	0.5	3.1	5.2	6.0
105°	0.0	0.3	2.6	4.6	5.4
107.5°	0.0	0.2	2.1	4.1	4.8
110°	0.0	0.1	1.7	3.5	4.3



TEST NUMBER: G2-2312-259-1

CATALOG NUMBER: CS-SL-9SCT-120-ID-UNV-W-SA-STD-1F-(Low-2700K)

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	0.0	0.0	1.3	3.0	3.7
115°	0.0	0.0	1.0	2.5	3.2
117.5°	0.0	0.0	0.7	2.0	2.7
120°	0.0	0.0	0.5	1.6	2.1
122.5°	0.0	0.0	0.3	1.2	1.7
125°	0.0	0.0	0.2	0.9	1.3
127.5°	0.0	0.0	0.1	0.7	1.0
130°	0.0	0.0	0.0	0.4	0.7
132.5°	0.0	0.0	0.0	0.0	0.0
135°	0.0	0.0	0.0	0.0	0.0
137.5°	0.0	0.0	0.0	0.0	0.0
140°	0.0	0.0	0.0	0.0	0.0
142.5°	0.0	0.0	0.0	0.0	0.0
145°	0.0	0.0	0.0	0.0	0.0
147.5°	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0

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

Report Prepared for

Cooper Lighting Solutions

iO LED

Report Number: SP1-2312-259-2

Test Date: 02/01/2024

Luminaire Tested: CS-SL-8SCT-120-ID-UNV-W-SA-STD-1F (LOW-2700K)

Data in this report applies to families of CS-SL-8SCT products.

Test Information

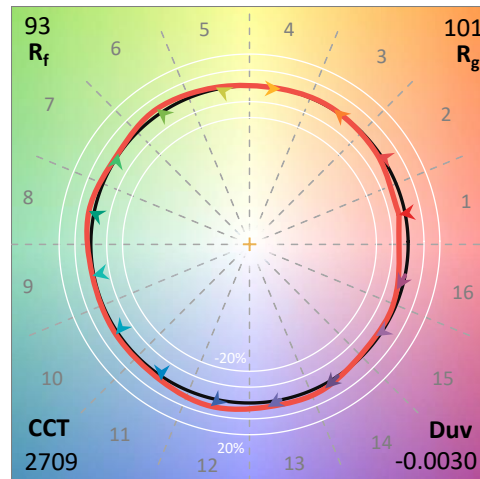
Test Method: LM-79-2019
 Report Number: SP1-2312-259-2
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 02/08/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: iO LED
 Catalog Number: **CS-SL-9SCT-120-ID-UNV-W-SA-STD-1F (LOW-2700K)**
 Description: IO LED COVSELECT ARCHITECTURAL COVE

Spectral Parameters

CCT (K): 2709
 CIE u': 0.2629
 CIE v': 0.5229
 Duv: -0.0030
 CIE x: 0.4541
 CIE y: 0.4014
 CIE z: 0.1445
 Peak Wavelength (nm): 621
 Dominant Wavelength (nm): 585
 Purity: 57

CRI (Ra):	94.3		
R1:	98.9	R9:	64.3
R2:	97.8	R10:	95.8
R3:	96.1	R11:	92.8
R4:	98.1	R12:	89.8
R5:	98.9	R13:	98.6
R6:	91.8	R14:	98.7
R7:	90.0		
R8:	82.5		

Rf: 93.5
 Rg: 101.4



Test Conditions

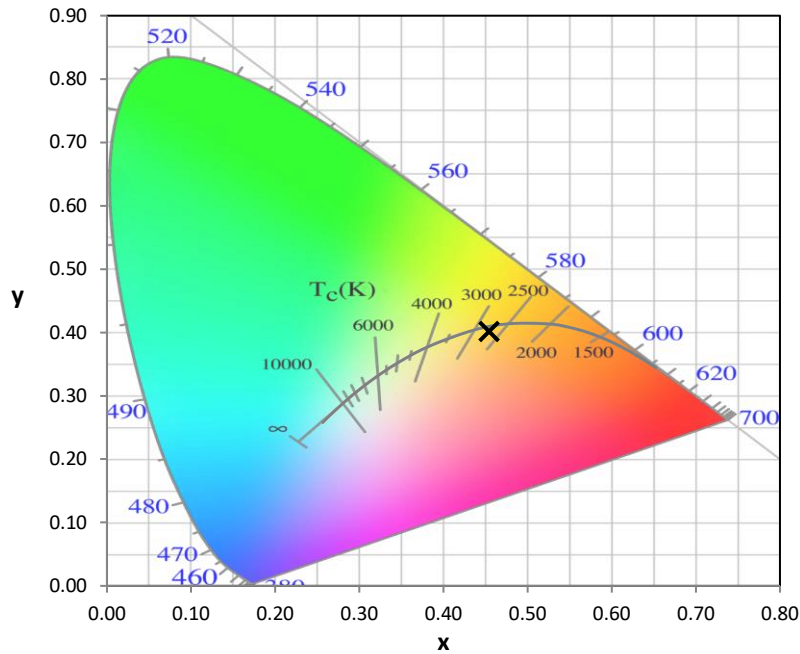
Stabilization Time: 10M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.4/24%
 Sphere Temperature (°C): 25.1

REPORT NUMBER: SP1-2312-259-2

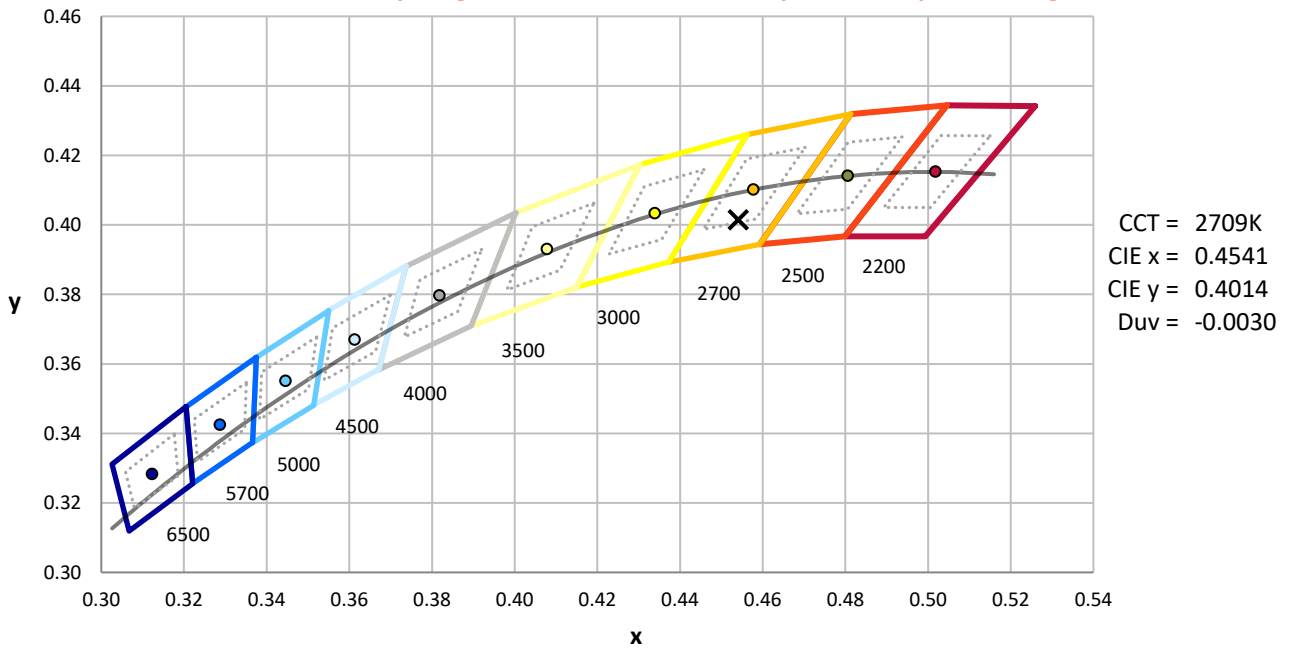
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	8/9/2023	2/9/2024
Power Meter	XITRON 2801 IN0071	10/23/2023	10/23/2024
AC Power Source	CHROMA 61603 IN0063	10/24/2023	10/24/2024
DC Power Source	AGILENT E3634A IN0208	10/24/2023	10/24/2024
Sphere Thermometer	ONSET IN0085	10/24/2023	10/24/2024
Room Thermometer	ONSET IN0046	10/24/2023	10/24/2024

REPORT NUMBER: SP1-2312-259-2

CIE 1931 Chromaticity Diagram



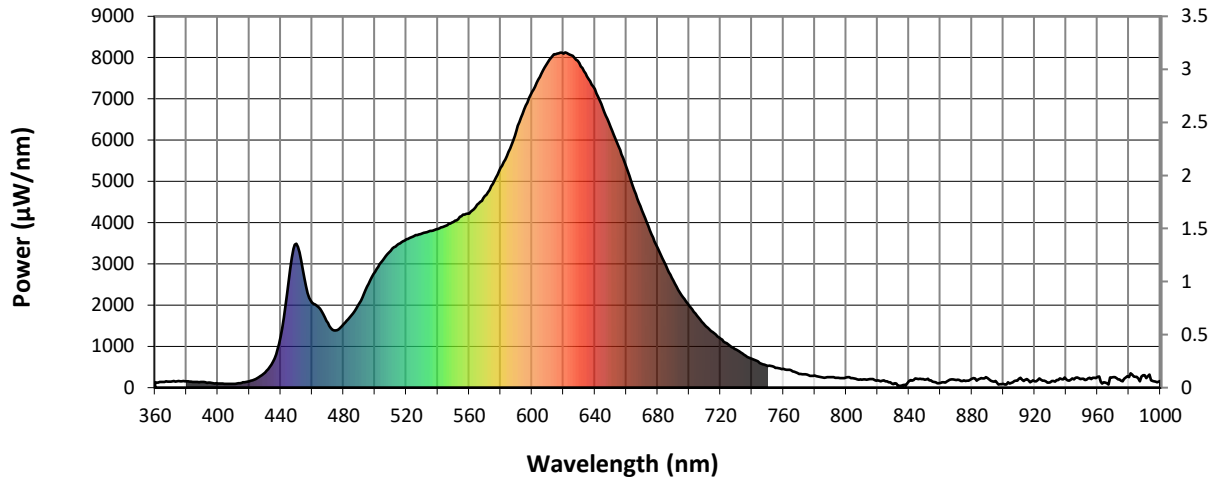
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2312-259-2

Photopic Flux vs. Wavelength

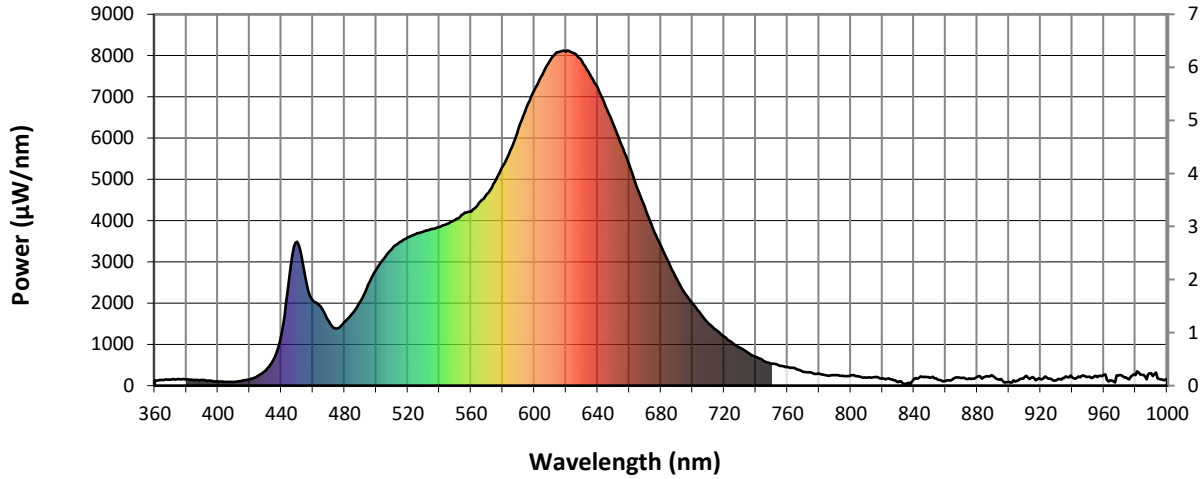


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λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)
360	128	NR	490	2047	NR	620	8098	NR	750	523	NR	880	215	NR
365	135	NR	495	2446	NR	625	8059	NR	755	482	NR	885	212	NR
370	148	NR	500	2805	NR	630	7868	NR	760	455	NR	890	234	NR
375	160	NR	505	3087	NR	635	7544	NR	765	416	NR	895	162	NR
380	154	NR	510	3319	NR	640	7231	NR	770	335	NR	900	93	NR
385	135	NR	515	3478	NR	645	6766	NR	775	314	NR	905	114	NR
390	135	NR	520	3595	NR	650	6319	NR	780	291	NR	910	219	NR
395	124	NR	525	3674	NR	655	5844	NR	785	243	NR	915	211	NR
400	98	NR	530	3737	NR	660	5350	NR	790	252	NR	920	151	NR
405	94	NR	535	3801	NR	665	4780	NR	795	238	NR	925	167	NR
410	93	NR	540	3844	NR	670	4296	NR	800	244	NR	930	127	NR
415	117	NR	545	3923	NR	675	3810	NR	805	226	NR	935	181	NR
420	152	NR	550	4015	NR	680	3391	NR	810	190	NR	940	202	NR
425	229	NR	555	4156	NR	685	2978	NR	815	211	NR	945	202	NR
430	366	NR	560	4217	NR	690	2593	NR	820	181	NR	950	214	NR
435	628	NR	565	4431	NR	695	2246	NR	825	154	NR	955	237	NR
440	1243	NR	570	4641	NR	700	1992	NR	830	86	NR	960	266	NR
445	2585	NR	575	4941	NR	705	1743	NR	835	42	NR	965	121	NR
450	3488	NR	580	5323	NR	710	1514	NR	840	162	NR	970	252	NR
455	2658	NR	585	5712	NR	715	1348	NR	845	219	NR	975	168	NR
460	2058	NR	590	6230	NR	720	1189	NR	850	191	NR	980	253	NR
465	1912	NR	595	6747	NR	725	1048	NR	855	145	NR	985	264	NR
470	1563	NR	600	7176	NR	730	920	NR	860	111	NR	990	303	NR
475	1388	NR	605	7528	NR	735	798	NR	865	167	NR	995	159	NR
480	1541	NR	610	7887	NR	740	696	NR	870	186	NR	1000	160	NR
485	1754	NR	615	8078	NR	745	595	NR	875	177	NR			

REPORT NUMBER: SP1-2312-259-2

Scotopic Flux vs. Wavelength



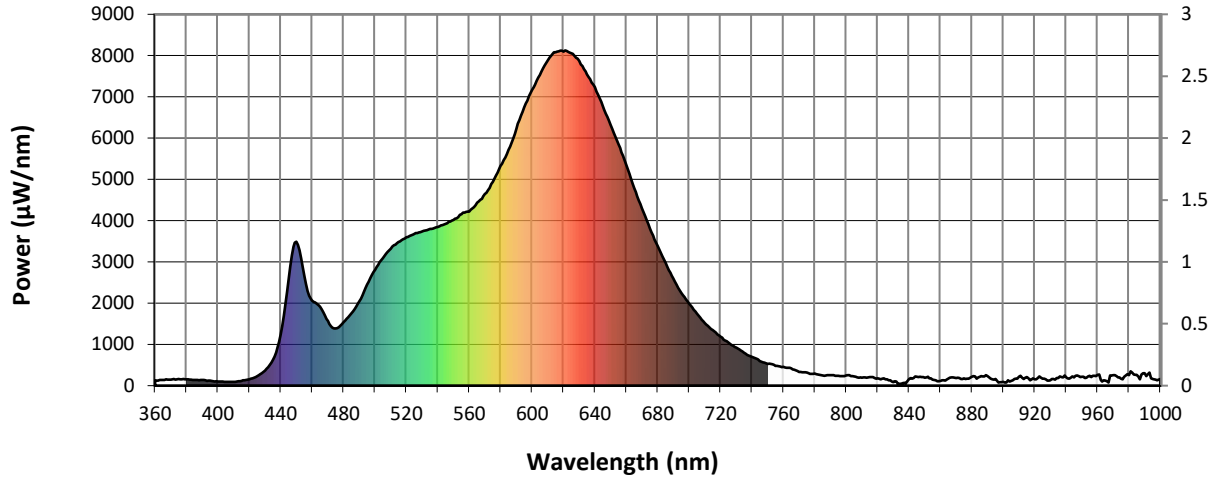
Scotopic Lumens: 478.3

S/P: 1.37

λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	128	NR	490	2047	NR	620	8098	NR	750	523	NR	880	215	NR
365	135	NR	495	2446	NR	625	8059	NR	755	482	NR	885	212	NR
370	148	NR	500	2805	NR	630	7868	NR	760	455	NR	890	234	NR
375	160	NR	505	3087	NR	635	7544	NR	765	416	NR	895	162	NR
380	154	NR	510	3319	NR	640	7231	NR	770	335	NR	900	93	NR
385	135	NR	515	3478	NR	645	6766	NR	775	314	NR	905	114	NR
390	135	NR	520	3595	NR	650	6319	NR	780	291	NR	910	219	NR
395	124	NR	525	3674	NR	655	5844	NR	785	243	NR	915	211	NR
400	98	NR	530	3737	NR	660	5350	NR	790	252	NR	920	151	NR
405	94	NR	535	3801	NR	665	4780	NR	795	238	NR	925	167	NR
410	93	NR	540	3844	NR	670	4296	NR	800	244	NR	930	127	NR
415	117	NR	545	3923	NR	675	3810	NR	805	226	NR	935	181	NR
420	152	NR	550	4015	NR	680	3391	NR	810	190	NR	940	202	NR
425	229	NR	555	4156	NR	685	2978	NR	815	211	NR	945	202	NR
430	366	NR	560	4217	NR	690	2593	NR	820	181	NR	950	214	NR
435	628	NR	565	4431	NR	695	2246	NR	825	154	NR	955	237	NR
440	1243	NR	570	4641	NR	700	1992	NR	830	86	NR	960	266	NR
445	2585	NR	575	4941	NR	705	1743	NR	835	42	NR	965	121	NR
450	3488	NR	580	5323	NR	710	1514	NR	840	162	NR	970	252	NR
455	2658	NR	585	5712	NR	715	1348	NR	845	219	NR	975	168	NR
460	2058	NR	590	6230	NR	720	1189	NR	850	191	NR	980	253	NR
465	1912	NR	595	6747	NR	725	1048	NR	855	145	NR	985	264	NR
470	1563	NR	600	7176	NR	730	920	NR	860	111	NR	990	303	NR
475	1388	NR	605	7528	NR	735	798	NR	865	167	NR	995	159	NR
480	1541	NR	610	7887	NR	740	696	NR	870	186	NR	1000	160	NR
485	1754	NR	615	8078	NR	745	595	NR	875	177	NR			

REPORT NUMBER: SP1-2312-259-2

Melanopic Flux vs. Wavelength



Melanopic Lumens: 184.2

M/P: 0.53

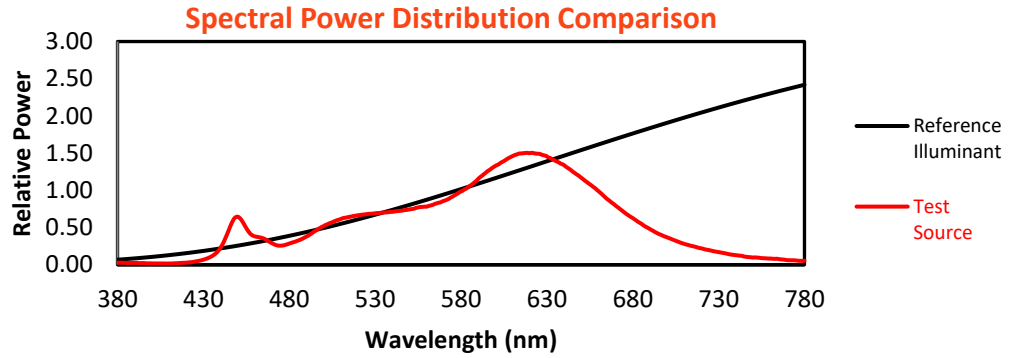
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	128	NR	490	2047	NR	620	8098	NR	750	523	NR	880	215	NR
365	135	NR	495	2446	NR	625	8059	NR	755	482	NR	885	212	NR
370	148	NR	500	2805	NR	630	7868	NR	760	455	NR	890	234	NR
375	160	NR	505	3087	NR	635	7544	NR	765	416	NR	895	162	NR
380	154	NR	510	3319	NR	640	7231	NR	770	335	NR	900	93	NR
385	135	NR	515	3478	NR	645	6766	NR	775	314	NR	905	114	NR
390	135	NR	520	3595	NR	650	6319	NR	780	291	NR	910	219	NR
395	124	NR	525	3674	NR	655	5844	NR	785	243	NR	915	211	NR
400	98	NR	530	3737	NR	660	5350	NR	790	252	NR	920	151	NR
405	94	NR	535	3801	NR	665	4780	NR	795	238	NR	925	167	NR
410	93	NR	540	3844	NR	670	4296	NR	800	244	NR	930	127	NR
415	117	NR	545	3923	NR	675	3810	NR	805	226	NR	935	181	NR
420	152	NR	550	4015	NR	680	3391	NR	810	190	NR	940	202	NR
425	229	NR	555	4156	NR	685	2978	NR	815	211	NR	945	202	NR
430	366	NR	560	4217	NR	690	2593	NR	820	181	NR	950	214	NR
435	628	NR	565	4431	NR	695	2246	NR	825	154	NR	955	237	NR
440	1243	NR	570	4641	NR	700	1992	NR	830	86	NR	960	266	NR
445	2585	NR	575	4941	NR	705	1743	NR	835	42	NR	965	121	NR
450	3488	NR	580	5323	NR	710	1514	NR	840	162	NR	970	252	NR
455	2658	NR	585	5712	NR	715	1348	NR	845	219	NR	975	168	NR
460	2058	NR	590	6230	NR	720	1189	NR	850	191	NR	980	253	NR
465	1912	NR	595	6747	NR	725	1048	NR	855	145	NR	985	264	NR
470	1563	NR	600	7176	NR	730	920	NR	860	111	NR	990	303	NR
475	1388	NR	605	7528	NR	735	798	NR	865	167	NR	995	159	NR
480	1541	NR	610	7887	NR	740	696	NR	870	186	NR	1000	160	NR
485	1754	NR	615	8078	NR	745	595	NR	875	177	NR			

REPORT NUMBER: SP1-2312-259-2

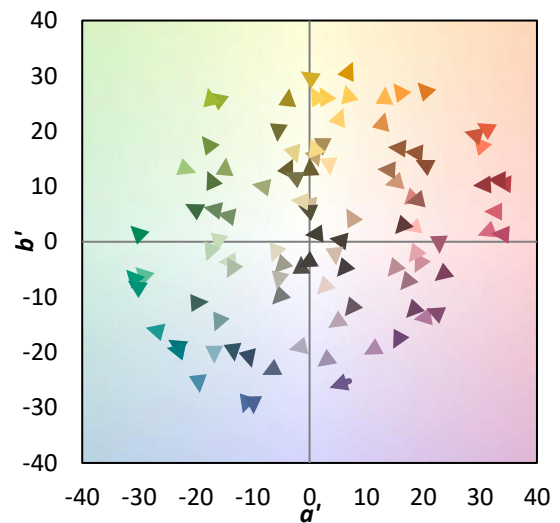
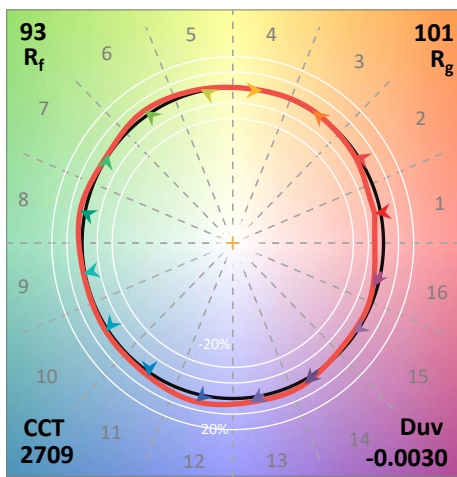
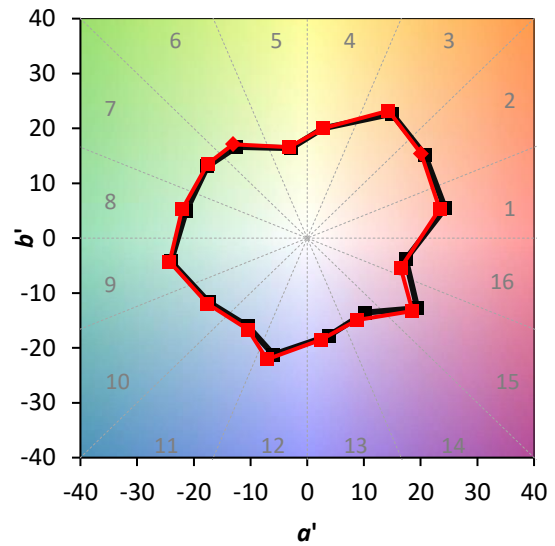
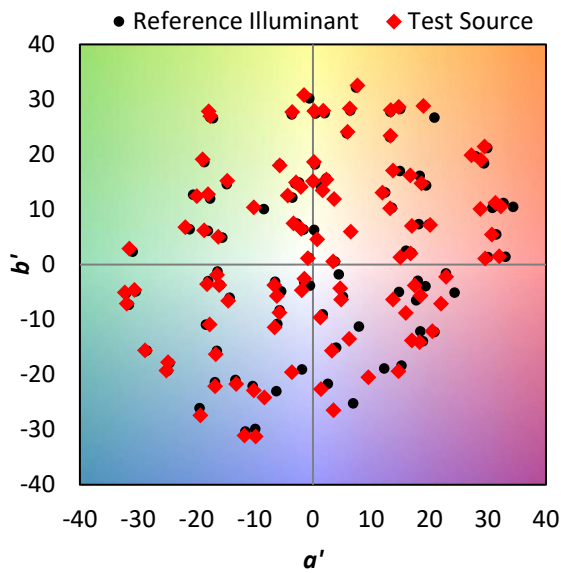
TM-30-18

Summary

$R_f = 93.5$
 $R_g = 101.4$
 $CIE R_a = 94.3$
 $R_9 = 64.3$



Color Vector Graphics

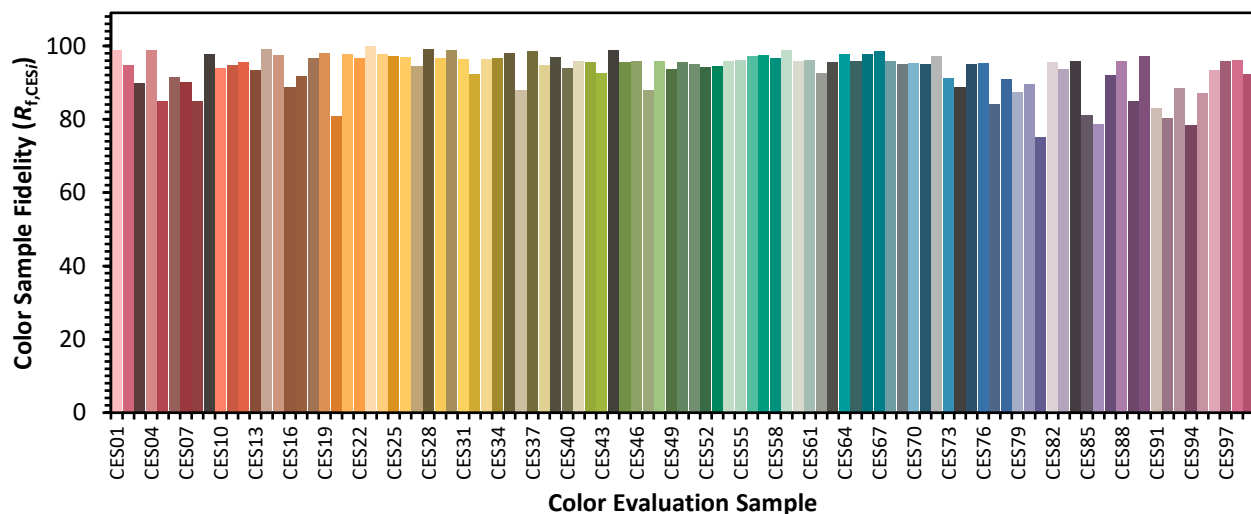


REPORT NUMBER: SP1-2312-259-2

TM-30-18

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

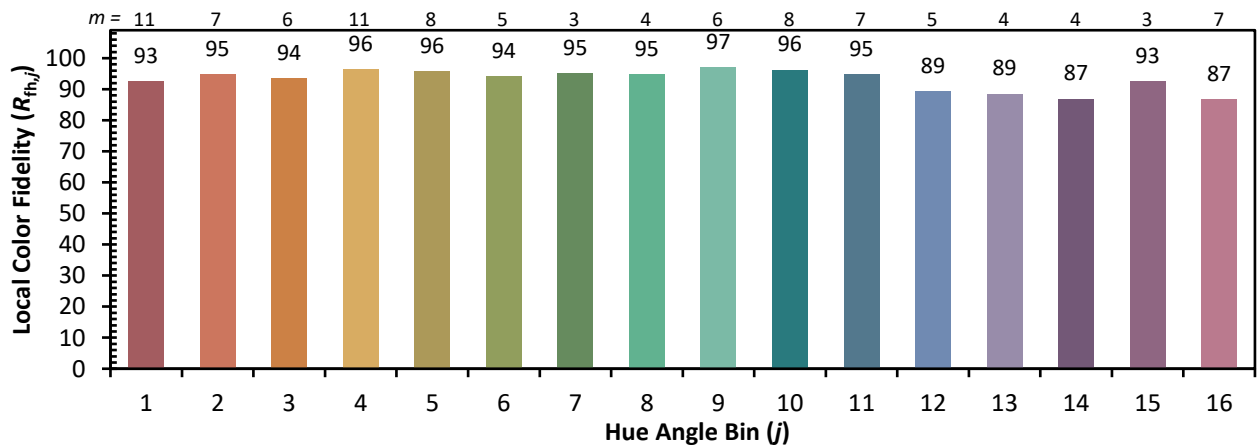
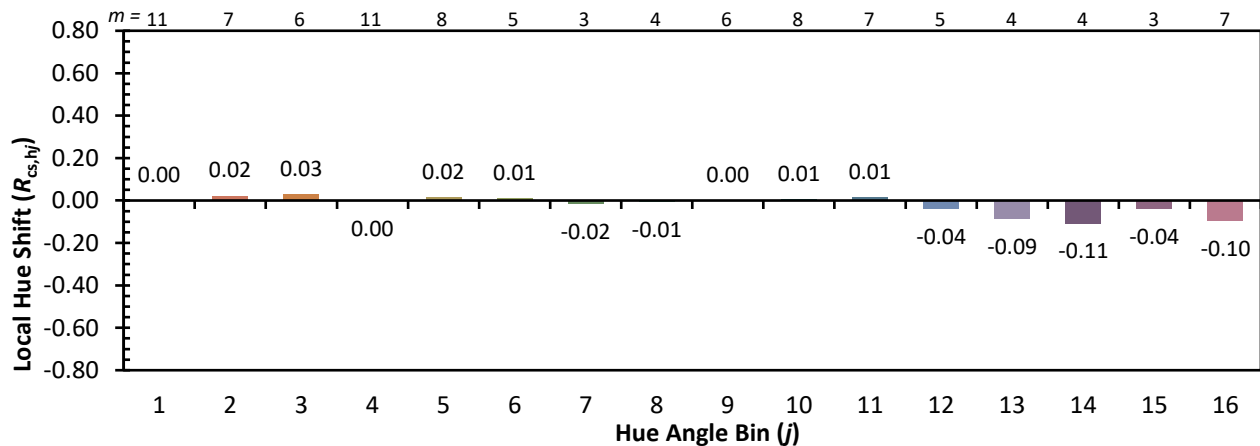
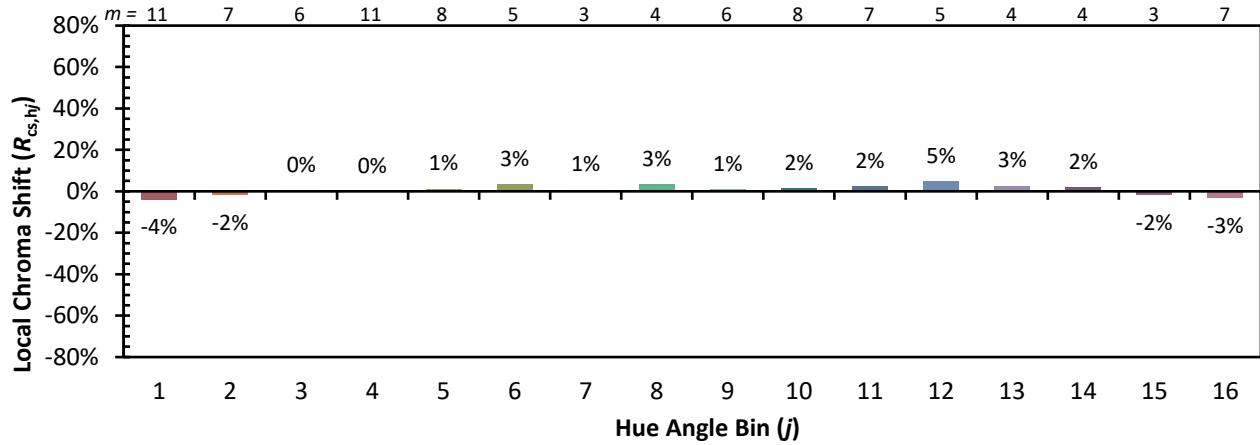
CES01 = 86	CES26 = 97	CES51 = 95	CES76 = 95
CES02 = 64	CES27 = 94	CES52 = 94	CES77 = 84
CES03 = 32	CES28 = 99	CES53 = 94	CES78 = 91
CES04 = 70	CES29 = 97	CES54 = 96	CES79 = 87
CES05 = 51	CES30 = 99	CES55 = 96	CES80 = 90
CES06 = 52	CES31 = 96	CES56 = 97	CES81 = 75
CES07 = 44	CES32 = 92	CES57 = 98	CES82 = 96
CES08 = 43	CES33 = 96	CES58 = 97	CES83 = 94
CES09 = 29	CES34 = 97	CES59 = 99	CES84 = 96
CES10 = 77	CES35 = 98	CES60 = 96	CES85 = 81
CES11 = 59	CES36 = 88	CES61 = 96	CES86 = 79
CES12 = 66	CES37 = 99	CES62 = 93	CES87 = 92
CES13 = 45	CES38 = 95	CES63 = 96	CES88 = 96
CES14 = 74	CES39 = 97	CES64 = 98	CES89 = 85
CES15 = 72	CES40 = 94	CES65 = 96	CES90 = 97
CES16 = 48	CES41 = 96	CES66 = 98	CES91 = 83
CES17 = 50	CES42 = 95	CES67 = 98	CES92 = 80
CES18 = 57	CES43 = 93	CES68 = 96	CES93 = 89
CES19 = 72	CES44 = 99	CES69 = 95	CES94 = 78
CES20 = 68	CES45 = 96	CES70 = 95	CES95 = 87
CES21 = 87	CES46 = 96	CES71 = 95	CES96 = 93
CES22 = 79	CES47 = 88	CES72 = 97	CES97 = 96
CES23 = 92	CES48 = 96	CES73 = 91	CES98 = 96
CES24 = 91	CES49 = 94	CES74 = 89	CES99 = 92
CES25 = 72	CES50 = 95	CES75 = 95	



REPORT NUMBER: SP1-2312-259-2

TM-30-18

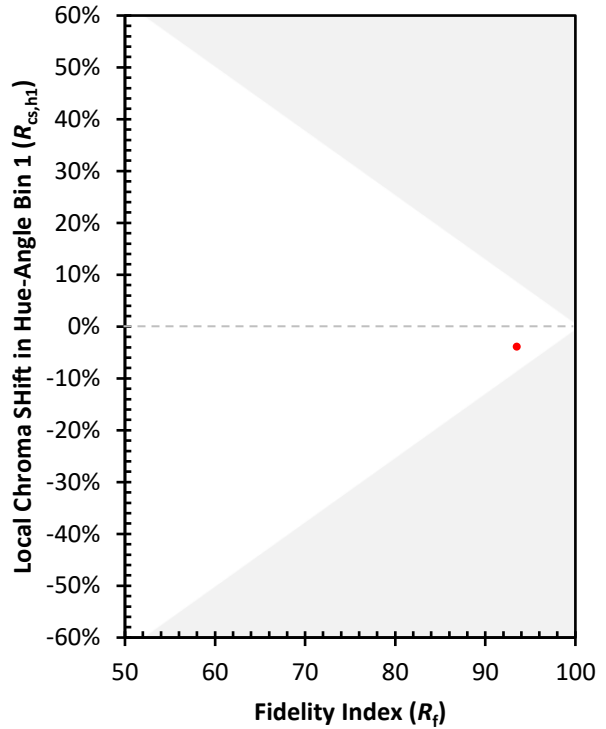
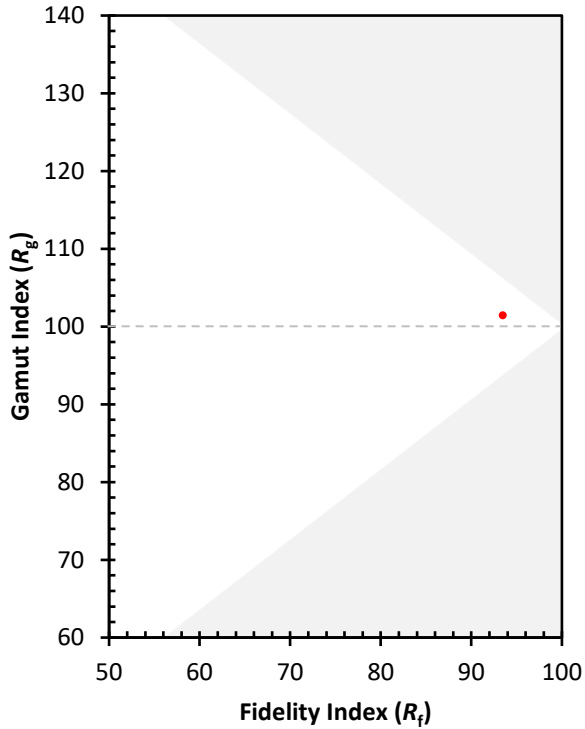
Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-2312-259-2

TM-30-18

Measure Comparisons



(END OF REPORT)