

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



Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State
Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: METALUX

Report Number: P774887

Luminaire Tested: **SPHB-1224SE-M-L84050-CD-U (24K LUMEN, 4000K)**

Issue Date: 2/21/2024



Test Information

Test Method: LM-79-08
Report Number: P774887
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2309-187-1)
Test Lab: INNOVATION CENTER
Issue Date: 2/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: SPHB-1224SE-M-L84050-CD-U (24K LUMEN, 4000K)
Description: 24000 Lumen SPHB at 4000K CCT
Light Source: -
Ballast/Driver: -

Summary

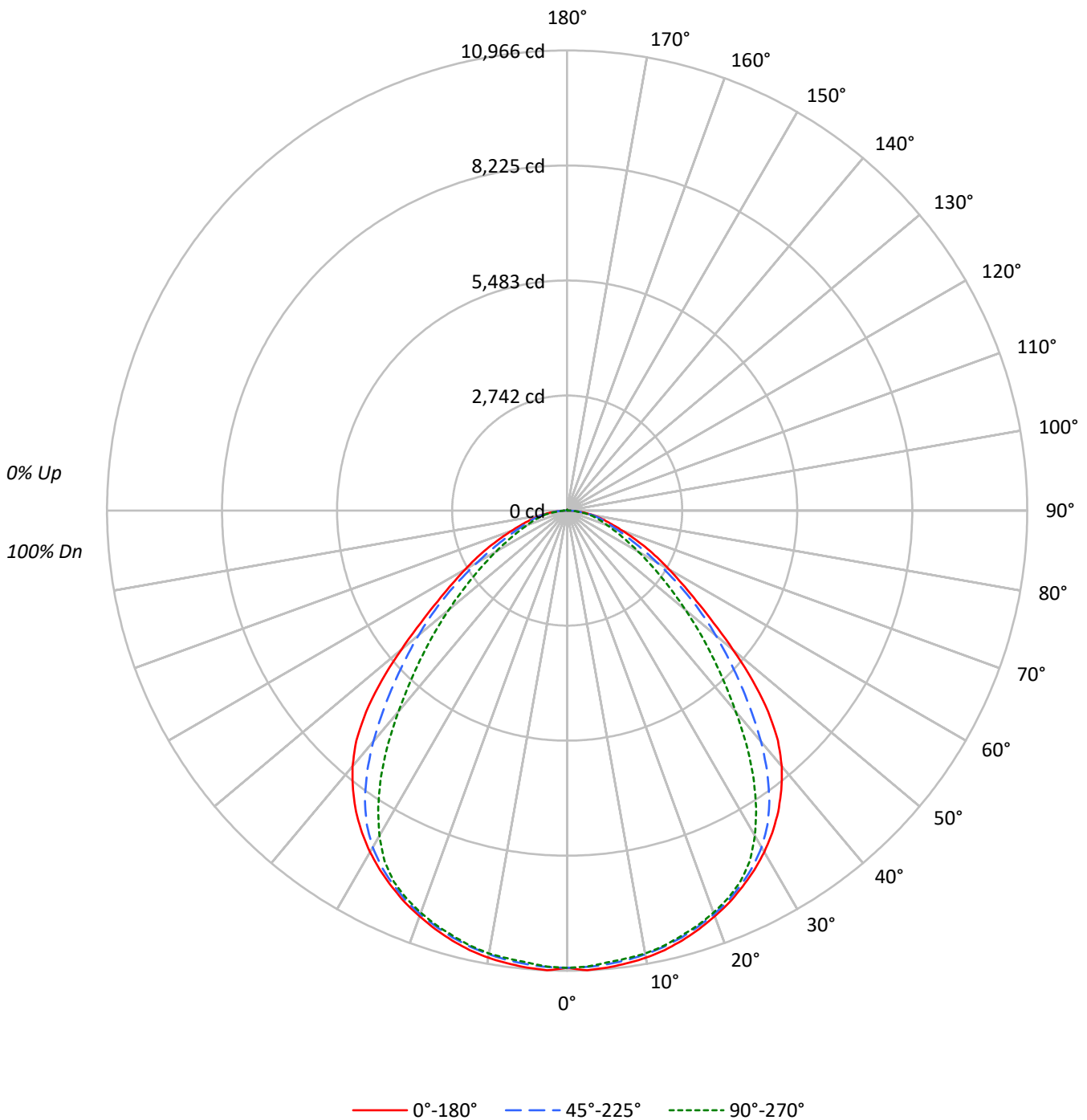
Lumens per Lamp: N/A
Luminaire Lumens: 24190.0 lumens
Efficiency: N/A
Efficacy: 147.5 lumens/watt
Spacing Criteria (0/90/45): 1.28 / 1.21 / 1.27
Luminous Opening: Rectangular (W 1' x L: 1.42' x H: 0')
CIE Type: Direct

Input Watts (W): 164
Input Voltage (V): NR
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: 25 FT

TEST NUMBER: P774887

CATALOG NUMBER: SPHB-1224SE-M-L84050-CD-U (24K LUMEN, 4000K)

Luminous Intensity Polar Plot





TEST NUMBER: P774887

CATALOG NUMBER: SPHB-1224SE-M-L84050-CD-U (24K LUMEN, 4000K)

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	50	30	10	0		
RCR																										
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100					100			
1	110	106	102	99	108	104	100	97	100	97	94	96	93	91	92	90	89	87					87			
2	102	94	88	83	99	92	87	82	89	84	80	86	82	79	83	80	77	75					75			
3	94	84	77	71	91	83	76	71	80	74	69	77	72	68	75	70	67	65					65			
4	86	76	68	62	84	74	67	61	72	65	60	70	64	60	68	63	59	57					57			
5	80	68	60	54	78	67	60	54	65	58	53	63	57	53	61	56	52	50					50			
6	74	62	54	48	73	61	53	48	59	52	47	58	52	47	56	51	47	45					45			
7	69	57	49	43	68	56	48	43	54	47	42	53	47	42	52	46	42	40					40			
8	65	52	44	39	63	51	44	38	50	43	38	49	43	38	48	42	38	36					36			
9	61	48	40	35	59	47	40	35	46	39	35	45	39	35	44	39	34	33					33			
10	57	44	37	32	56	44	37	32	43	36	32	42	36	32	41	36	31	30					30			

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	82786	82786	82786
5°	83379	82803	82476
10°	83480	82854	82688
15°	83425	82846	82552
20°	83182	82776	82444
25°	82901	82408	81861
30°	82429	81299	78502
35°	81316	77942	71723
40°	78897	71304	61980
45°	72827	62697	52376
50°	61011	54685	43508
55°	49857	46299	35823
60°	42569	37553	29745
65°	36834	30547	25350
70°	31095	26538	22540
75°	27868	25760	22038
80°	27706	25829	22158
85°	24148	23904	18700



TEST NUMBER: P774887

CATALOG NUMBER: SPHB-1224SE-M-L84050-CD-U (24K LUMEN, 4000K)

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	1032.0	4.3
10°-20°	2971.3	12.3
20°-30°	4510.6	18.6
30°-40°	5158.2	21.3
40°-50°	4469.3	18.5
50°-60°	3033.1	12.5
60°-70°	1744.5	7.2
70°-80°	929.4	3.8
80°-90°	301.2	1.2
90°-100°	8.6	0.0
100°-110°	2.8	0.0
110°-120°	2.8	0.0
120°-130°	3.9	0.0
130°-140°	5.3	0.0
140°-150°	6.1	0.0
150°-160°	5.5	0.0
160°-170°	4.0	0.0
170°-180°	1.5	0.0
0°-30°	8513.9	35.2
0°-40°	13672.1	56.5
0°-60°	21174.5	87.5
0°-90°	24149.6	99.8
90°-120°	14.1	0.1
90°-150°	29.4	0.1
90°-180°	40.0	0.2
0°-180°	24190.0	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	10896	10896	10896	10896	10896	
5°	10932	10832	10856	10832	10814	###
15°	10606	10509	10532	10505	10495	2993
25°	9888	9804	9830	9792	9764	4558
35°	8767	8632	8403	7916	7732	5468
45°	6778	6409	5835	5124	4874	5152
55°	3764	3784	3495	2938	2704	3429
65°	2049	1920	1699	1568	1410	2042
75°	949	934	878	804	751	1032
85°	277	284	274	227	214	298
90°	3	20	41	50	51	15
95°	2	3	4	4	4	1
105°	2	2	3	3	4	2
115°	2	3	3	3	4	2
125°	4	4	5	5	5	4
135°	6	6	6	8	8	5
145°	9	9	9	10	10	6
155°	11	11	12	12	12	5
165°	14	14	14	15	15	4
175°	15	15	16	16	17	1
180°	16	16	16	16	16	



TEST NUMBER: P774887

CATALOG NUMBER: SPHB-1224SE-M-L84050-CD-U (24K LUMEN, 4000K)

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	10895.7	10895.7	10895.7	10895.7	10895.7
2.5°	10965.6	10868.6	10886.3	10873.3	10880.7
5°	10932.0	10832.2	10856.5	10832.2	10813.6
7.5°	10883.5	10782.8	10806.1	10779.1	10766.0
10°	10820.1	10717.5	10739.0	10721.3	10717.5
12.5°	10728.7	10628.0	10649.5	10628.0	10626.2
15°	10605.6	10508.7	10532.0	10504.9	10494.7
17.5°	10455.5	10364.1	10393.0	10372.5	10361.3
20°	10287.6	10202.8	10237.3	10206.5	10196.3
22.5°	10107.7	10017.2	10050.8	10020.9	10003.2
25°	9888.5	9803.7	9829.8	9792.5	9764.5
27.5°	9655.4	9557.5	9573.3	9483.8	9423.2
30°	9395.2	9287.0	9266.5	9067.9	8947.6
32.5°	9103.3	8979.3	8885.1	8533.6	8380.6
35°	8766.7	8632.4	8403.0	7916.2	7732.5
37.5°	8386.2	8213.7	7825.8	7269.1	7012.6
40°	7954.5	7710.1	7188.9	6550.1	6248.9
42.5°	7436.0	7085.3	6501.6	5822.7	5533.6
45°	6777.6	6409.3	5834.8	5124.2	4874.3
47.5°	5991.5	5711.7	5210.0	4486.4	4255.1
50°	5161.5	5065.5	4626.3	3924.1	3680.7
52.5°	4394.1	4418.3	4059.3	3394.4	3165.9
55°	3763.7	3784.2	3495.1	2938.4	2704.3
57.5°	3239.6	3190.2	2959.8	2519.7	2307.1
60°	2801.3	2688.5	2471.2	2155.1	1957.4
62.5°	2417.1	2271.6	2057.2	1837.1	1653.4
65°	2048.8	1920.1	1699.1	1567.6	1410.0
67.5°	1700.0	1619.8	1428.6	1335.4	1192.7
70°	1399.7	1362.4	1194.6	1131.2	1014.6
72.5°	1155.4	1132.1	1026.7	959.6	879.4
75°	949.3	934.4	877.5	803.8	750.7
77.5°	791.7	770.3	734.8	671.4	627.6
80°	633.2	618.3	590.3	538.1	506.4
82.5°	452.3	452.3	440.2	394.5	365.6
85°	277.0	284.4	274.2	226.6	214.5
87.5°	100.7	111.9	125.9	124.0	122.2
90°	2.8	19.6	41.0	50.4	51.3
92.5°	0.9	3.7	6.5	10.3	9.3
95°	1.9	2.8	3.7	3.7	3.7
97.5°	1.9	1.9	3.7	3.7	3.7
100°	1.9	1.9	2.8	3.7	3.7
102.5°	0.9	1.9	2.8	3.7	3.7
105°	1.9	1.9	2.8	2.8	3.7
107.5°	1.9	1.9	2.8	2.8	2.8
110°	1.9	1.9	2.8	2.8	3.7



TEST NUMBER: P774887

CATALOG NUMBER: SPHB-1224SE-M-L84050-CD-U (24K LUMEN, 4000K)

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	1.9	1.9	2.8	2.8	2.8
115°	1.9	2.8	2.8	2.8	3.7
117.5°	2.8	2.8	2.8	3.7	3.7
120°	2.8	2.8	3.7	3.7	3.7
122.5°	3.7	3.7	3.7	3.7	3.7
125°	3.7	3.7	4.7	4.7	4.7
127.5°	4.7	4.7	4.7	4.7	5.6
130°	4.7	5.6	5.6	5.6	5.6
132.5°	5.6	6.5	6.5	6.5	6.5
135°	6.5	6.5	6.5	7.5	7.5
137.5°	7.5	7.5	7.5	7.5	7.5
140°	8.4	8.4	8.4	8.4	8.4
142.5°	8.4	9.3	9.3	9.3	9.3
145°	9.3	9.3	9.3	10.3	10.3
147.5°	10.3	10.3	10.3	10.3	10.3
150°	10.3	11.2	11.2	11.2	11.2
152.5°	11.2	11.2	11.2	12.1	12.1
155°	11.2	11.2	12.1	12.1	12.1
157.5°	12.1	12.1	13.1	13.1	13.1
160°	12.1	13.1	13.1	14.0	14.0
162.5°	13.1	13.1	14.0	14.0	14.0
165°	14.0	14.0	14.0	14.9	14.9
167.5°	14.0	14.0	14.9	14.9	15.9
170°	14.9	14.9	14.9	15.9	15.9
172.5°	14.9	14.9	14.9	15.9	15.9
175°	14.9	14.9	15.9	15.9	16.8
177.5°	14.9	14.9	15.9	16.8	16.8
180°	15.9	15.9	15.9	15.9	15.9

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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2309-187-7

Test Date: 10/09/2023

Luminaire Tested: SPHB-1224SE-M-UNV-L84050-CD-U (24K LUMEN 4000K)

Data in this report applies to families of products including SPHB-1224SE-M-UNV-L84050-CD-U (24K LUMEN 4000K).

Tested By:

Approved By:



NVLAP Lab Code: 200050-0

Cooper Lighting Solutions laboratories have been accredited by National Voluntary Laboratory Accreditation Program (NVLAP) that it adheres to the requirements of ISO/IEC 17025:2017 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 and can affect the validity of the test results. Information related to the luminaire tested has been supplied by requestor. Report shall not be reproduced except in full without approval of Cooper Lighting Solutions Laboratory. Test performed at address noted above

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2309-187-7
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/09/2023
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: METALUX
 Catalog Number: **SPHB-1224SE-M-UNV-L84050-CD-U (24K LUMEN 4000K)**
 Description: SPHB SELECT, MEDIUM LENS, 24K LUMENS, 4000K

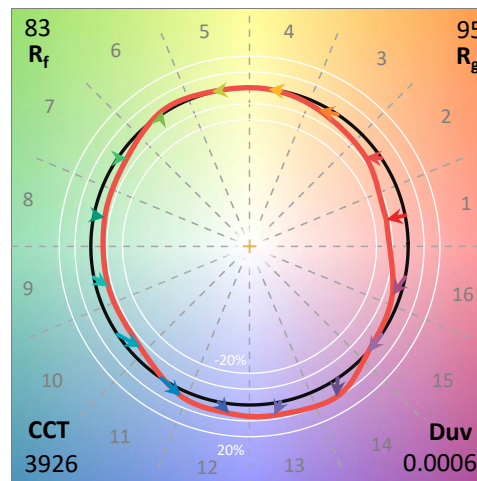
Spectral Parameters

CCT (K): 3926
 CIE u': 0.2261
 CIE v': 0.5037
 Duv: 0.0006
 CIE x: 0.3841
 CIE y: 0.3802
 CIE z: 0.2357
 Peak Wavelength (nm): 454
 Dominant Wavelength (nm): 579
 Purity: 29.5

CRI (Ra): 82.0
 R1: 80.3
 R2: 88.4
 R3: 93.9
 R4: 80.2
 R5: 79.7
 R6: 83.3
 R7: 86.1
 R8: 64.3

R9: 8.2
 R10: 71.6
 R11: 78.1
 R12: 57.5
 R13: 82.3
 R14: 96.6

Rf: 82.9
 Rg: 95



Test Conditions

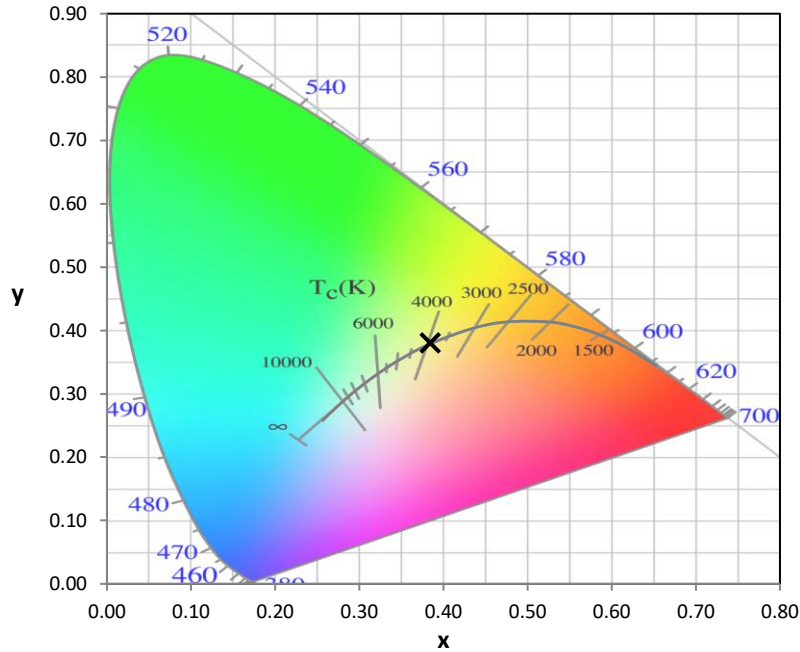
Stabilization Time: 23M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.5/33%
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2309-187-7

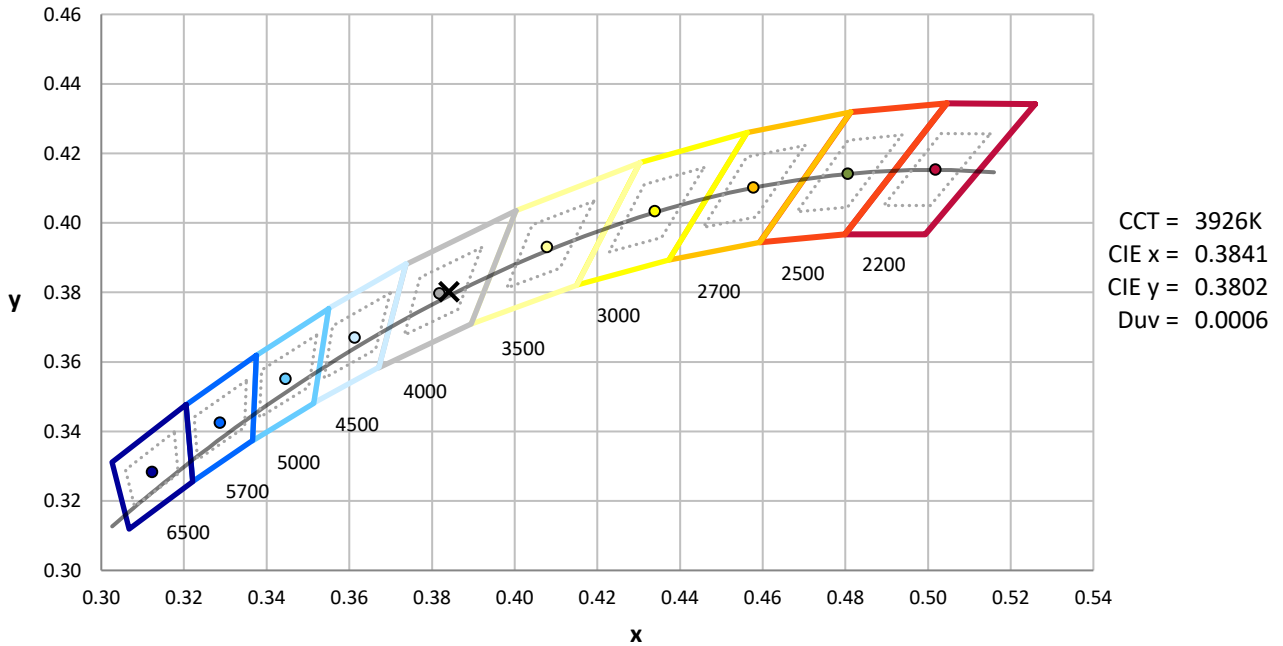
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	8/9/2023	2/9/2024
Power Meter	XITRON 2801 IN0071	11/29/2022	11/29/2023
AC Power Source	CHROMA 61603 IN0063	11/28/2022	11/28/2023
DC Power Source	AGILENT E3634A IN0208	11/28/2022	11/28/2023
Sphere Thermometer	ONSET IN0085	11/28/2022	11/28/2023
Room Thermometer	ONSET IN0046	11/28/2022	11/28/2023

REPORT NUMBER: SP1-2309-187-7

CIE 1931 Chromaticity Diagram



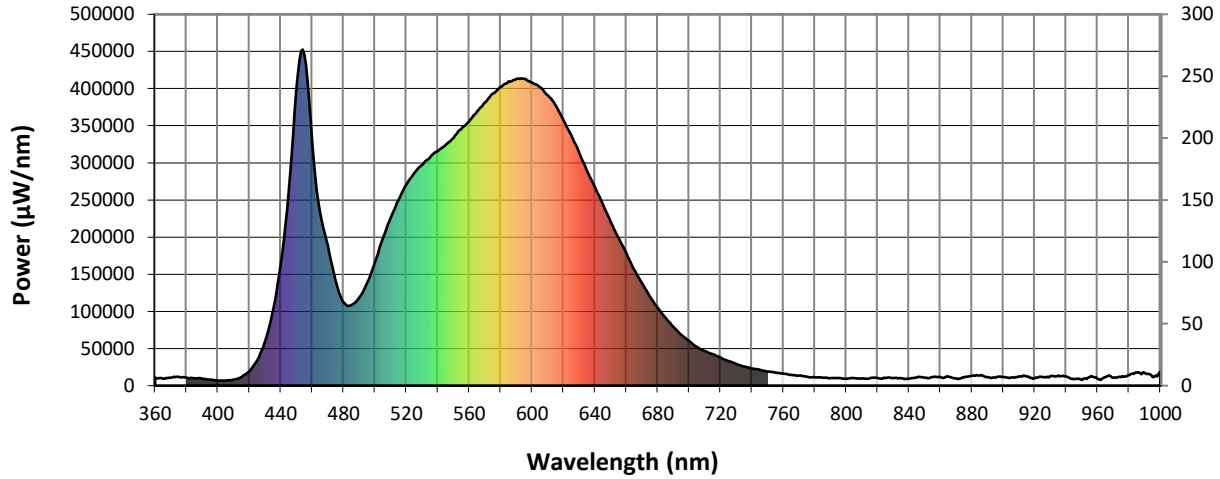
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2309-187-7

Photopic Flux vs. Wavelength

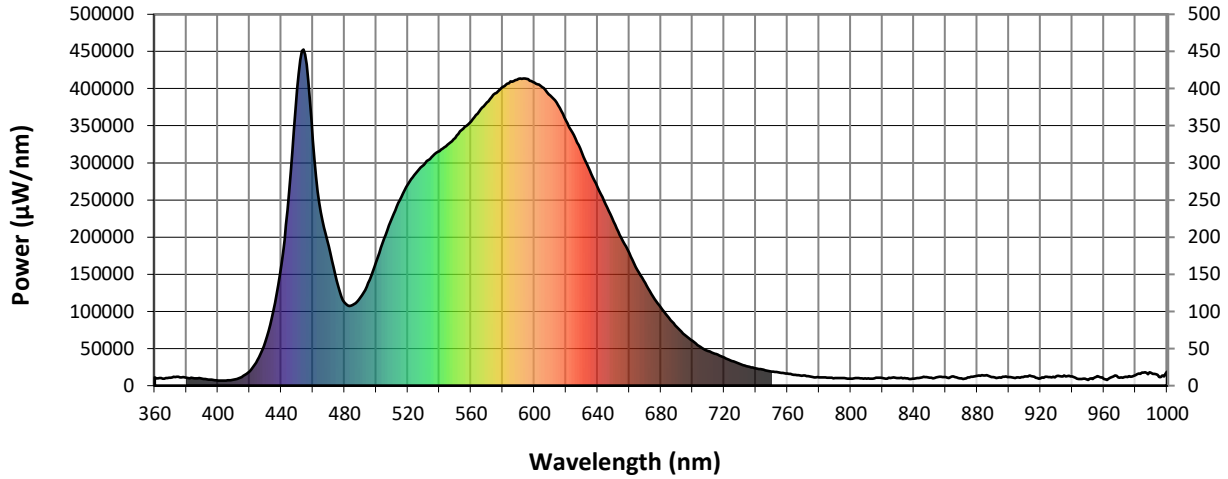


#####

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	10992	NR	490	118921	NR	620	356922	NR	750	19019	NR	880	13091	NR
365	9593	NR	495	138088	NR	625	337439	NR	755	17413	NR	885	13768	NR
370	10476	NR	500	166483	NR	630	313667	NR	760	16262	NR	890	11509	NR
375	11916	NR	505	198126	NR	635	289634	NR	765	14555	NR	895	10746	NR
380	10857	NR	510	225943	NR	640	267120	NR	770	13516	NR	900	11526	NR
385	9836	NR	515	249652	NR	645	244025	NR	775	12156	NR	905	11085	NR
390	9329	NR	520	270963	NR	650	221090	NR	780	11138	NR	910	12484	NR
395	8104	NR	525	285863	NR	655	198958	NR	785	10805	NR	915	12235	NR
400	6858	NR	530	297396	NR	660	178676	NR	790	10121	NR	920	9666	NR
405	6914	NR	535	307535	NR	665	155862	NR	795	10392	NR	925	11659	NR
410	8077	NR	540	315948	NR	670	138150	NR	800	9549	NR	930	12967	NR
415	11717	NR	545	324499	NR	675	120142	NR	805	10057	NR	935	13555	NR
420	19513	NR	550	333620	NR	680	105107	NR	810	9285	NR	940	12553	NR
425	34423	NR	555	345725	NR	685	91191	NR	815	9751	NR	945	9165	NR
430	59393	NR	560	355808	NR	690	79275	NR	820	10216	NR	950	7624	NR
435	101278	NR	565	369262	NR	695	68358	NR	825	10410	NR	955	11686	NR
440	162827	NR	570	381413	NR	700	60050	NR	830	10058	NR	960	9106	NR
445	260438	NR	575	393089	NR	705	51990	NR	835	9982	NR	965	11345	NR
450	399252	NR	580	402225	NR	710	46653	NR	840	9215	NR	970	10672	NR
455	445742	NR	585	409494	NR	715	42391	NR	845	11311	NR	975	11689	NR
460	330661	NR	590	413322	NR	720	37628	NR	850	10813	NR	980	14054	NR
465	233593	NR	595	413160	NR	725	33220	NR	855	11652	NR	985	17684	NR
470	187643	NR	600	408148	NR	730	29243	NR	860	11468	NR	990	17244	NR
475	140648	NR	605	401766	NR	735	25806	NR	865	12591	NR	995	11439	NR
480	111871	NR	610	390821	NR	740	23374	NR	870	9925	NR	1000	19016	NR
485	108472	NR	615	377363	NR	745	21294	NR	875	11284	NR			

REPORT NUMBER: SP1-2309-187-7

Scotopic Flux vs. Wavelength

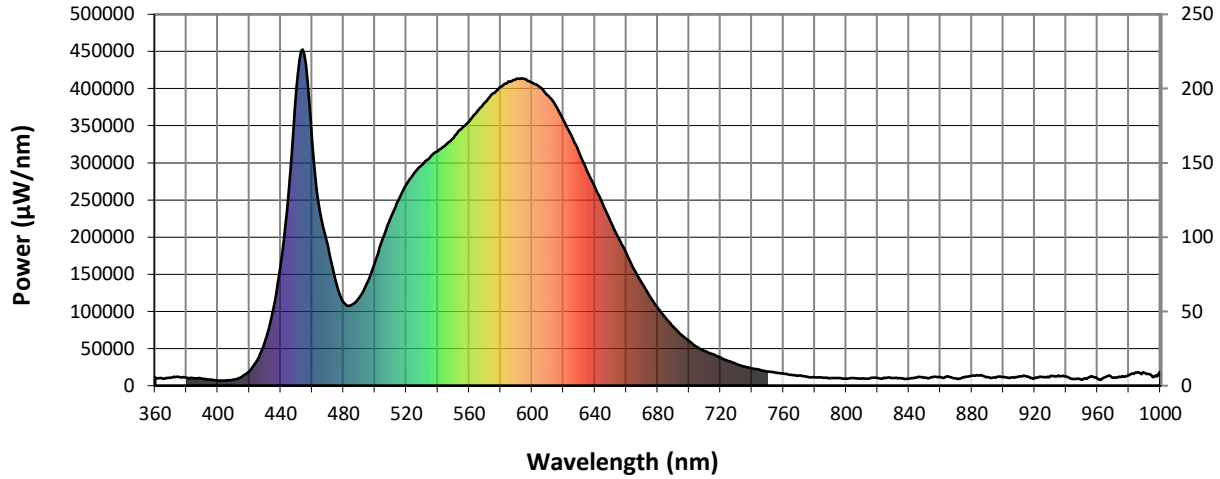


Scotopic Lumens: 39237.7 S/P: 1.65

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	10992	NR	490	118921	NR	620	356922	NR	750	19019	NR	880	13091	NR
365	9593	NR	495	138088	NR	625	337439	NR	755	17413	NR	885	13768	NR
370	10476	NR	500	166483	NR	630	313667	NR	760	16262	NR	890	11509	NR
375	11916	NR	505	198126	NR	635	289634	NR	765	14555	NR	895	10746	NR
380	10857	NR	510	225943	NR	640	267120	NR	770	13516	NR	900	11526	NR
385	9836	NR	515	249652	NR	645	244025	NR	775	12156	NR	905	11085	NR
390	9329	NR	520	270963	NR	650	221090	NR	780	11138	NR	910	12484	NR
395	8104	NR	525	285863	NR	655	198958	NR	785	10805	NR	915	12235	NR
400	6858	NR	530	297396	NR	660	178676	NR	790	10121	NR	920	9666	NR
405	6914	NR	535	307535	NR	665	155862	NR	795	10392	NR	925	11659	NR
410	8077	NR	540	315948	NR	670	138150	NR	800	9549	NR	930	12967	NR
415	11717	NR	545	324499	NR	675	120142	NR	805	10057	NR	935	13555	NR
420	19513	NR	550	333620	NR	680	105107	NR	810	9285	NR	940	12553	NR
425	34423	NR	555	345725	NR	685	91191	NR	815	9751	NR	945	9165	NR
430	59393	NR	560	355808	NR	690	79275	NR	820	10216	NR	950	7624	NR
435	101278	NR	565	369262	NR	695	68358	NR	825	10410	NR	955	11686	NR
440	162827	NR	570	381413	NR	700	60050	NR	830	10058	NR	960	9106	NR
445	260438	NR	575	393089	NR	705	51990	NR	835	9982	NR	965	11345	NR
450	399252	NR	580	402225	NR	710	46653	NR	840	9215	NR	970	10672	NR
455	445742	NR	585	409494	NR	715	42391	NR	845	11311	NR	975	11689	NR
460	330661	NR	590	413322	NR	720	37628	NR	850	10813	NR	980	14054	NR
465	233593	NR	595	413160	NR	725	33220	NR	855	11652	NR	985	17684	NR
470	187643	NR	600	408148	NR	730	29243	NR	860	11468	NR	990	17244	NR
475	140648	NR	605	401766	NR	735	25806	NR	865	12591	NR	995	11439	NR
480	111871	NR	610	390821	NR	740	23374	NR	870	9925	NR	1000	19016	NR
485	108472	NR	615	377363	NR	745	21294	NR	875	11284	NR			

REPORT NUMBER: SP1-2309-187-7

Melanopic Flux vs. Wavelength



Melanopic Lumens: 15753

M/P: 0.66

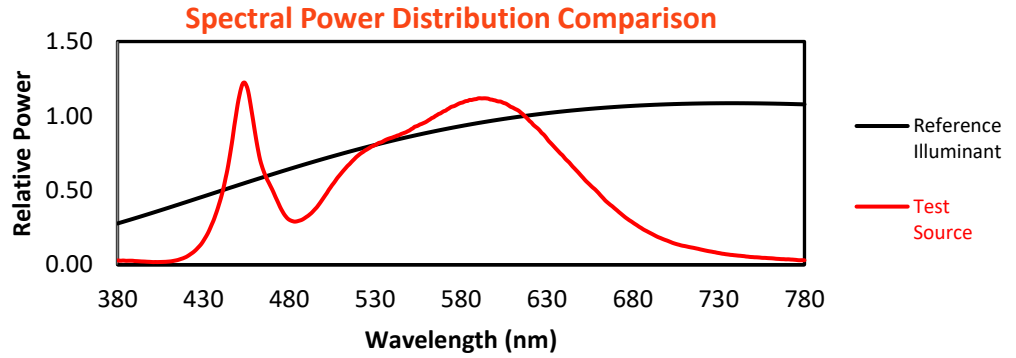
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	10992	NR	490	118921	NR	620	356922	NR	750	19019	NR	880	13091	NR
365	9593	NR	495	138088	NR	625	337439	NR	755	17413	NR	885	13768	NR
370	10476	NR	500	166483	NR	630	313667	NR	760	16262	NR	890	11509	NR
375	11916	NR	505	198126	NR	635	289634	NR	765	14555	NR	895	10746	NR
380	10857	NR	510	225943	NR	640	267120	NR	770	13516	NR	900	11526	NR
385	9836	NR	515	249652	NR	645	244025	NR	775	12156	NR	905	11085	NR
390	9329	NR	520	270963	NR	650	221090	NR	780	11138	NR	910	12484	NR
395	8104	NR	525	285863	NR	655	198958	NR	785	10805	NR	915	12235	NR
400	6858	NR	530	297396	NR	660	178676	NR	790	10121	NR	920	9666	NR
405	6914	NR	535	307535	NR	665	155862	NR	795	10392	NR	925	11659	NR
410	8077	NR	540	315948	NR	670	138150	NR	800	9549	NR	930	12967	NR
415	11717	NR	545	324499	NR	675	120142	NR	805	10057	NR	935	13555	NR
420	19513	NR	550	333620	NR	680	105107	NR	810	9285	NR	940	12553	NR
425	34423	NR	555	345725	NR	685	91191	NR	815	9751	NR	945	9165	NR
430	59393	NR	560	355808	NR	690	79275	NR	820	10216	NR	950	7624	NR
435	101278	NR	565	369262	NR	695	68358	NR	825	10410	NR	955	11686	NR
440	162827	NR	570	381413	NR	700	60050	NR	830	10058	NR	960	9106	NR
445	260438	NR	575	393089	NR	705	51990	NR	835	9982	NR	965	11345	NR
450	399252	NR	580	402225	NR	710	46653	NR	840	9215	NR	970	10672	NR
455	445742	NR	585	409494	NR	715	42391	NR	845	11311	NR	975	11689	NR
460	330661	NR	590	413322	NR	720	37628	NR	850	10813	NR	980	14054	NR
465	233593	NR	595	413160	NR	725	33220	NR	855	11652	NR	985	17684	NR
470	187643	NR	600	408148	NR	730	29243	NR	860	11468	NR	990	17244	NR
475	140648	NR	605	401766	NR	735	25806	NR	865	12591	NR	995	11439	NR
480	111871	NR	610	390821	NR	740	23374	NR	870	9925	NR	1000	19016	NR
485	108472	NR	615	377363	NR	745	21294	NR	875	11284	NR			

REPORT NUMBER: SP1-2309-187-7

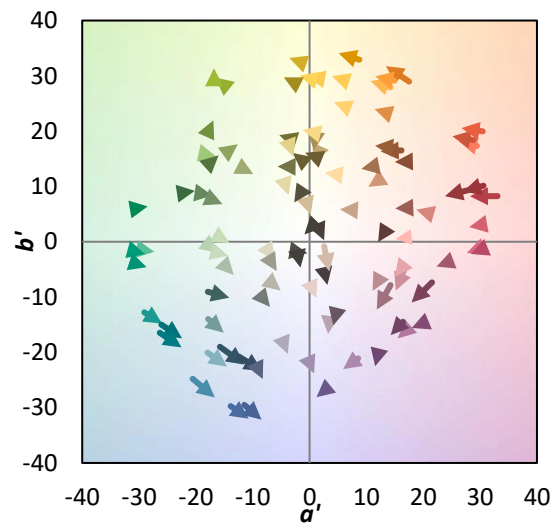
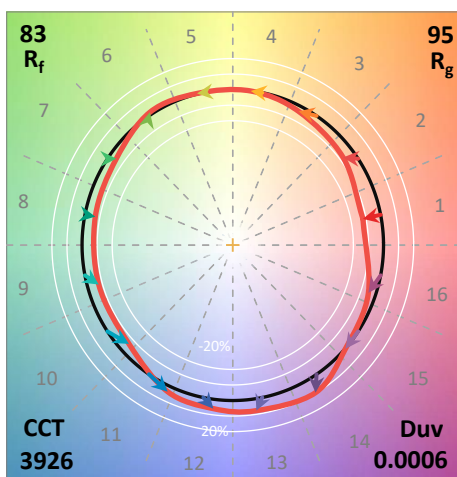
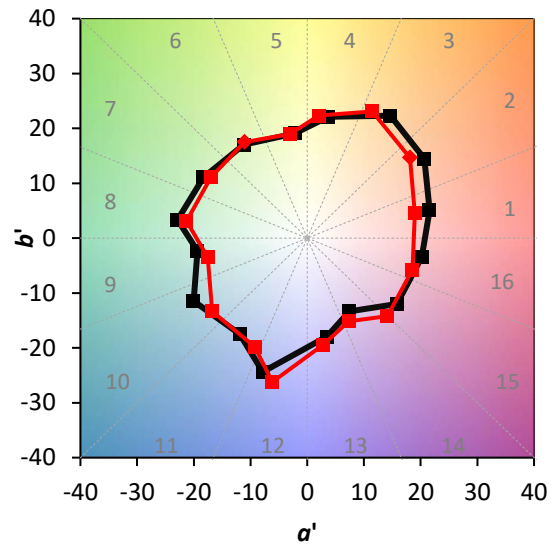
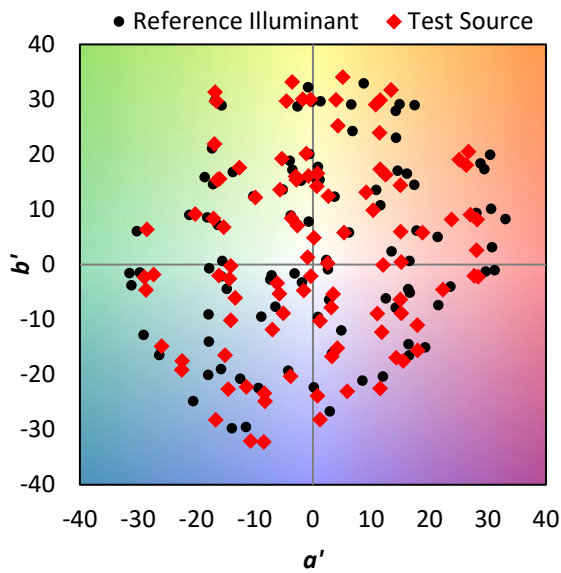
TM-30-18

Summary

$R_f = 82.9$
 $R_g = 95$
 CIE $R_a = 82.0$
 $R_9 = 8.2$



Color Vector Graphics

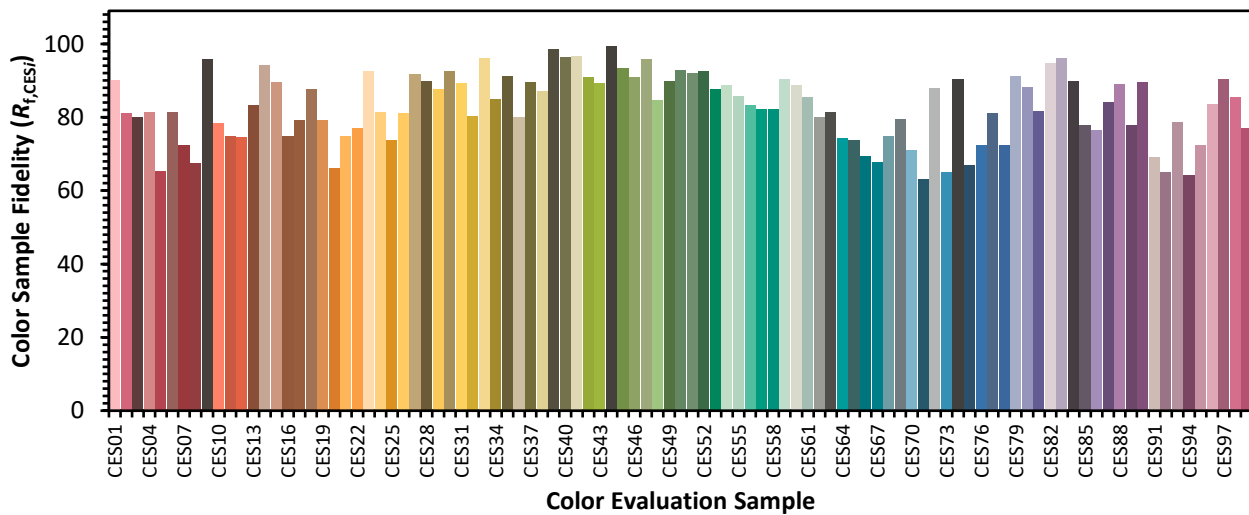


REPORT NUMBER: SP1-2309-187-7

TM-30-18

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

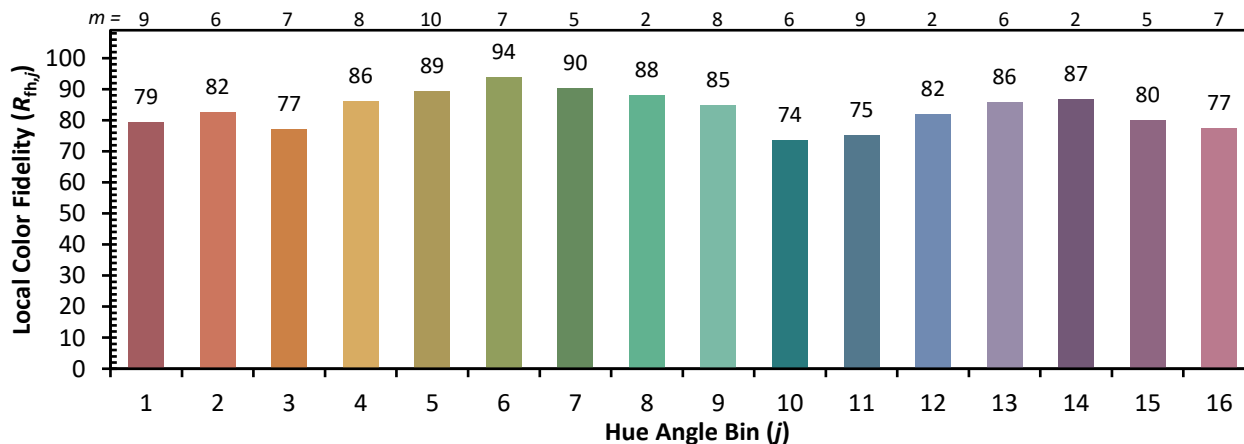
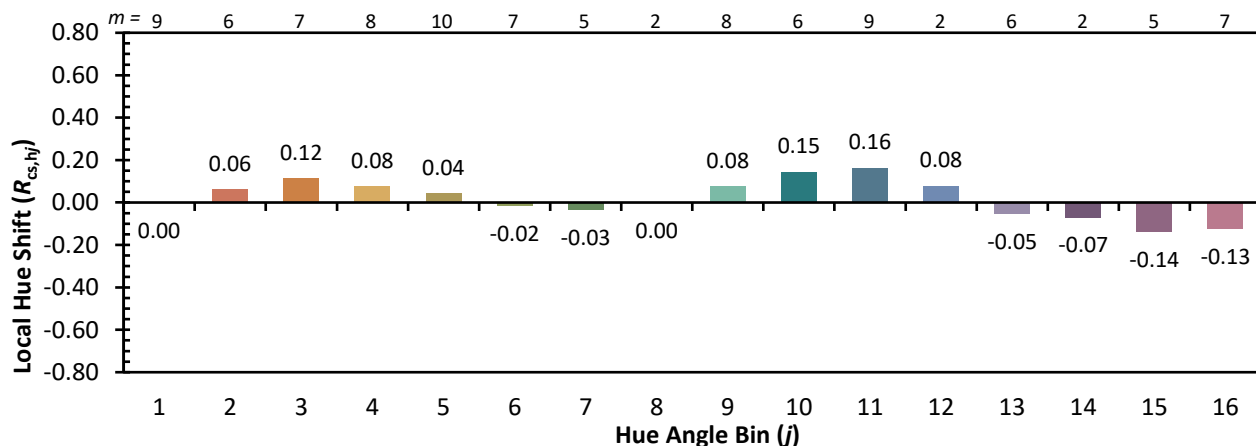
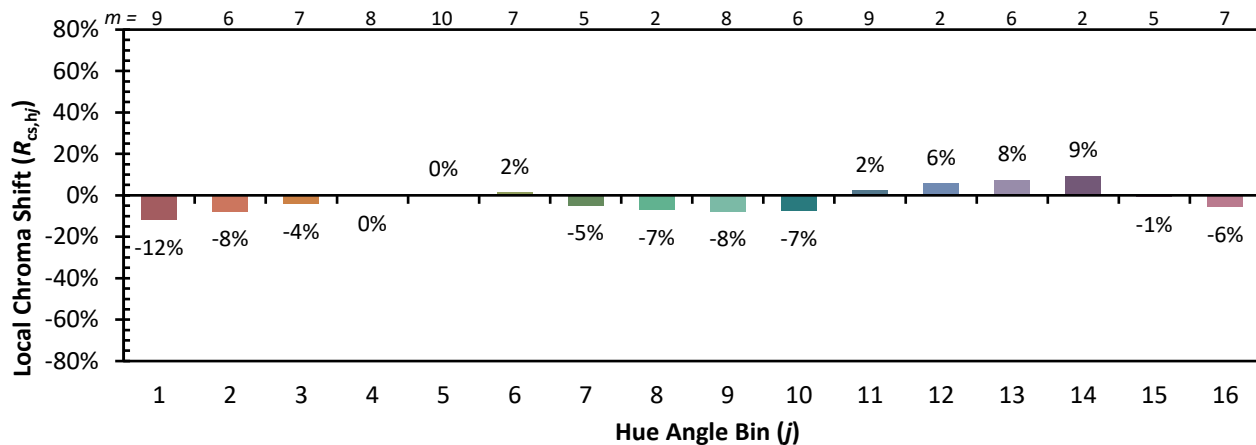
CES01 = 86	CES26 = 81	CES51 = 92	CES76 = 73
CES02 = 61	CES27 = 92	CES52 = 92	CES77 = 81
CES03 = 31	CES28 = 90	CES53 = 88	CES78 = 72
CES04 = 70	CES29 = 88	CES54 = 89	CES79 = 91
CES05 = 48	CES30 = 92	CES55 = 86	CES80 = 88
CES06 = 50	CES31 = 89	CES56 = 83	CES81 = 82
CES07 = 41	CES32 = 80	CES57 = 82	CES82 = 95
CES08 = 40	CES33 = 96	CES58 = 82	CES83 = 96
CES09 = 29	CES34 = 85	CES59 = 90	CES84 = 90
CES10 = 74	CES35 = 91	CES60 = 89	CES85 = 78
CES11 = 57	CES36 = 80	CES61 = 85	CES86 = 76
CES12 = 63	CES37 = 90	CES62 = 80	CES87 = 84
CES13 = 42	CES38 = 87	CES63 = 81	CES88 = 89
CES14 = 74	CES39 = 98	CES64 = 74	CES89 = 78
CES15 = 71	CES40 = 96	CES65 = 74	CES90 = 90
CES16 = 47	CES41 = 97	CES66 = 69	CES91 = 69
CES17 = 49	CES42 = 91	CES67 = 68	CES92 = 65
CES18 = 56	CES43 = 89	CES68 = 75	CES93 = 79
CES19 = 71	CES44 = 99	CES69 = 80	CES94 = 64
CES20 = 65	CES45 = 93	CES70 = 71	CES95 = 72
CES21 = 86	CES46 = 91	CES71 = 63	CES96 = 84
CES22 = 78	CES47 = 96	CES72 = 88	CES97 = 90
CES23 = 91	CES48 = 85	CES73 = 65	CES98 = 85
CES24 = 90	CES49 = 90	CES74 = 90	CES99 = 77
CES25 = 71	CES50 = 93	CES75 = 67	



REPORT NUMBER: SP1-2309-187-7

TM-30-18

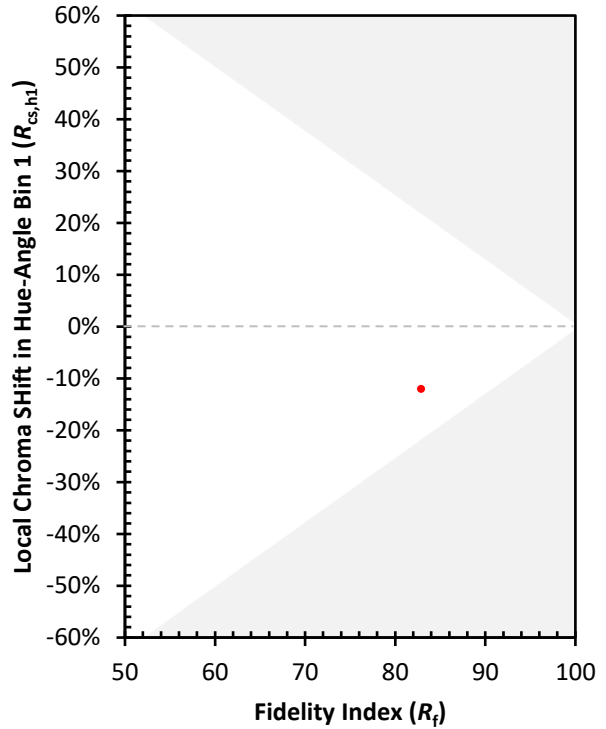
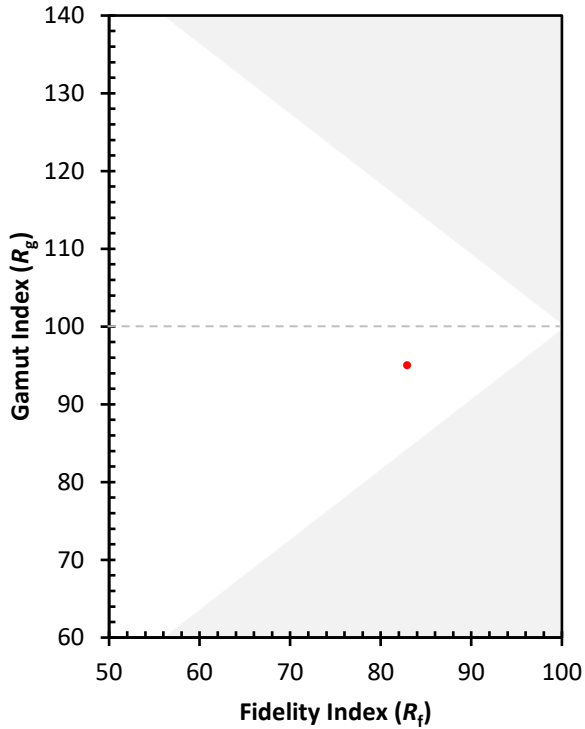
Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-2309-187-7

TM-30-18

Measure Comparisons



(END OF REPORT)