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: INVUE

Report Number: P869216

Luminaire Tested: **EMM2-HSN-SA1A-AMB-U-T1**

Issue Date: 08/22/2024

Report Generated By 670245763

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

Scaled Data Report

Test Information

Test Method:	LM-79-08
Report Number:	P869216
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	08/22/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HSN-SA1A-AMB-U-T1
Description:	EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 15W 0CRI 1540K FIXTURE w/ TYPE 1 DISTRIBUTION OPTIC
Light Source:	(10) 1540K CCT, 0 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	631.1 lumens
Efficiency:	N/A
Efficacy:	39.4 lumens/watt
Luminous Opening:	Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification:	Type I - Short
BUG Rating:	B0 - U0 - G0

Input Watts (W):	16
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.98
Total Harmonic Distortion (THDi):	9.98%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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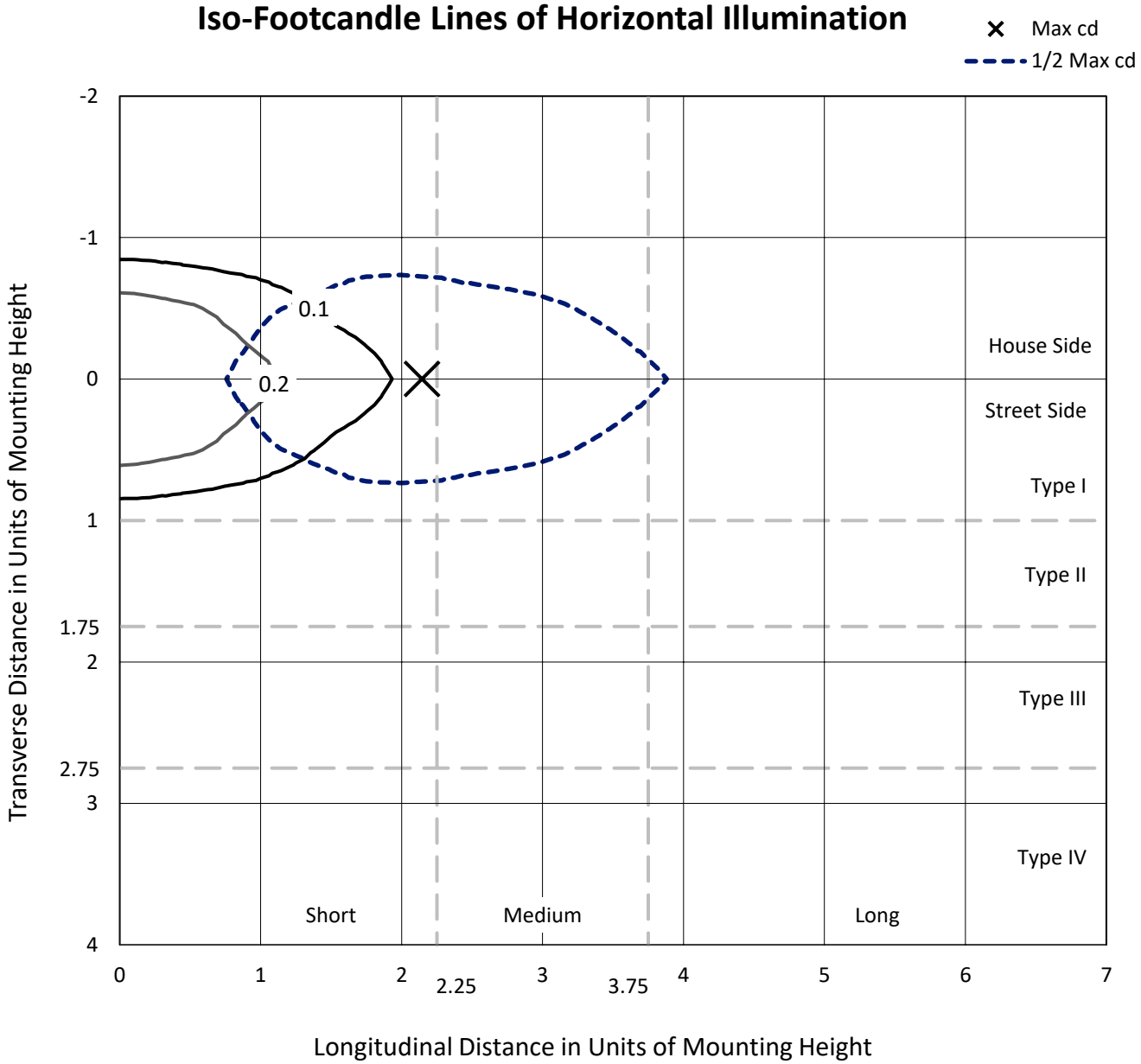
REPORT NUMBER: P869216
CATALOG NUMBER: EMM2-HSN-SA1A-AMB-U-T1

Iso-Footcandle Lines of Horizontal Illumination



Based on 20 foot mounting height. Maximum calculated value = 0.4 fc
Type I - Short - N/A

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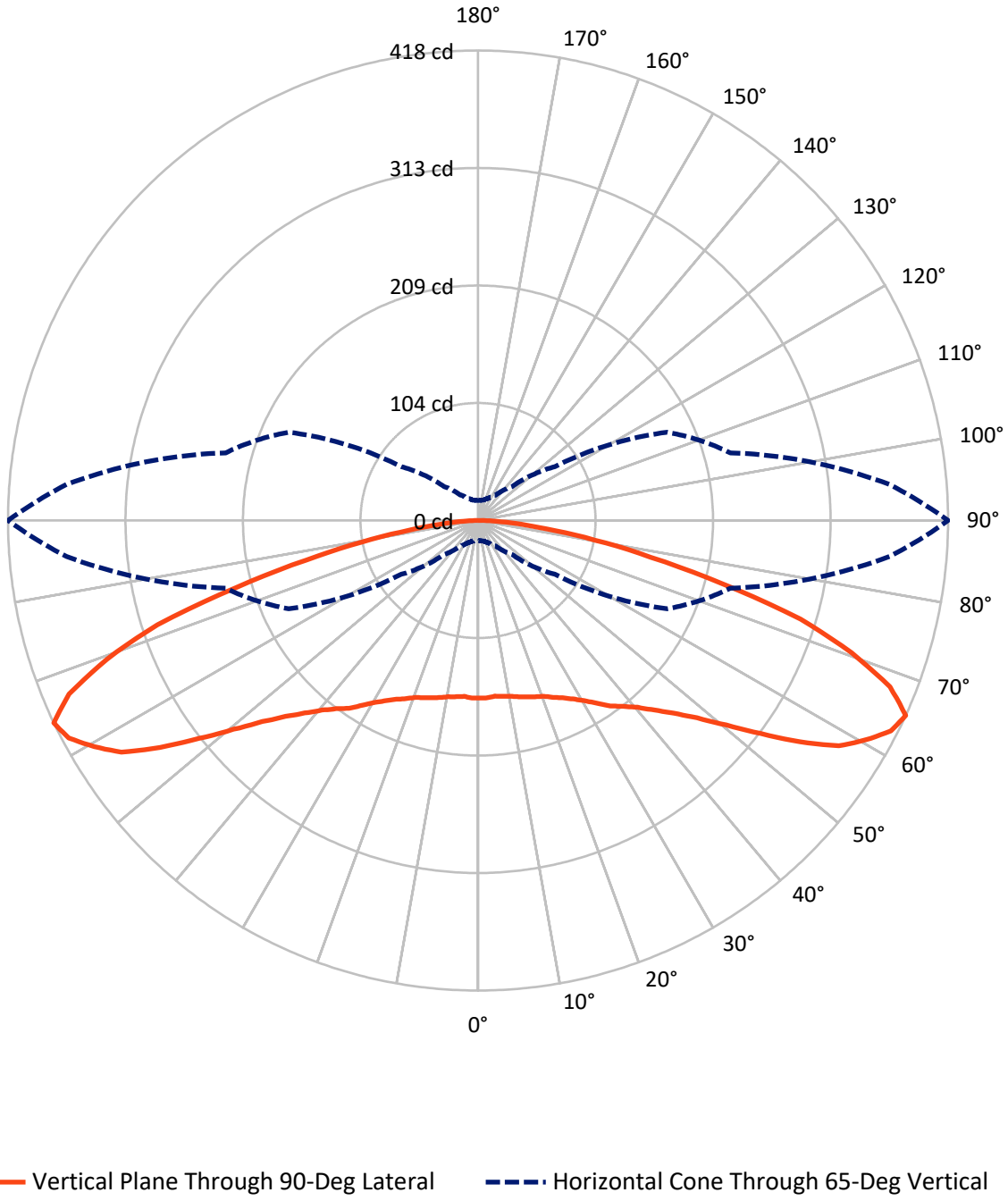
Luminous Intensity Polar Plot



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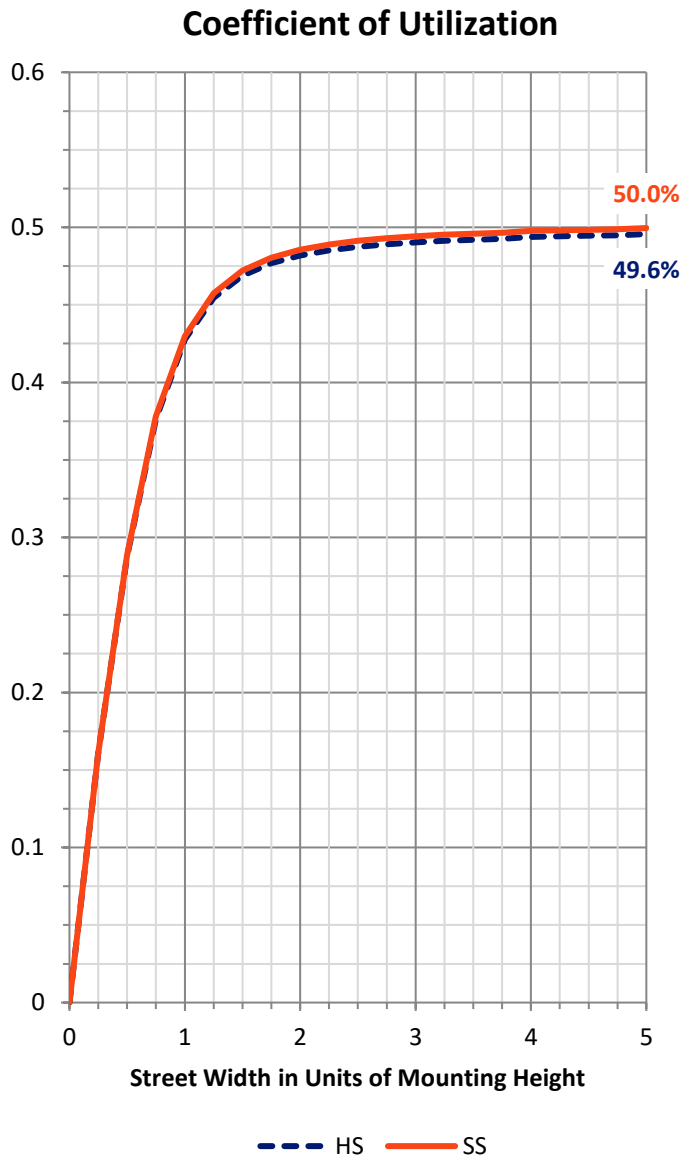
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	315.5	0.0	315.5
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	315.5	0.0	315.5
	% Fixture	50.0	0.0	50.0
Total	Lumens	631.1	0.0	631.1
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	14.9	2.4
10°-20°	43.5	6.9
20°-30°	71.3	11.3
30°-40°	95.1	15.1
40°-50°	109.5	17.3
50°-60°	117.3	18.6
60°-70°	108.3	17.2
70°-80°	58.3	9.2
80°-90°	12.9	2.0
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
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°-90°	631.1	100.0
0°-180°	631.1	100.0



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REPORT NUMBER: P869216
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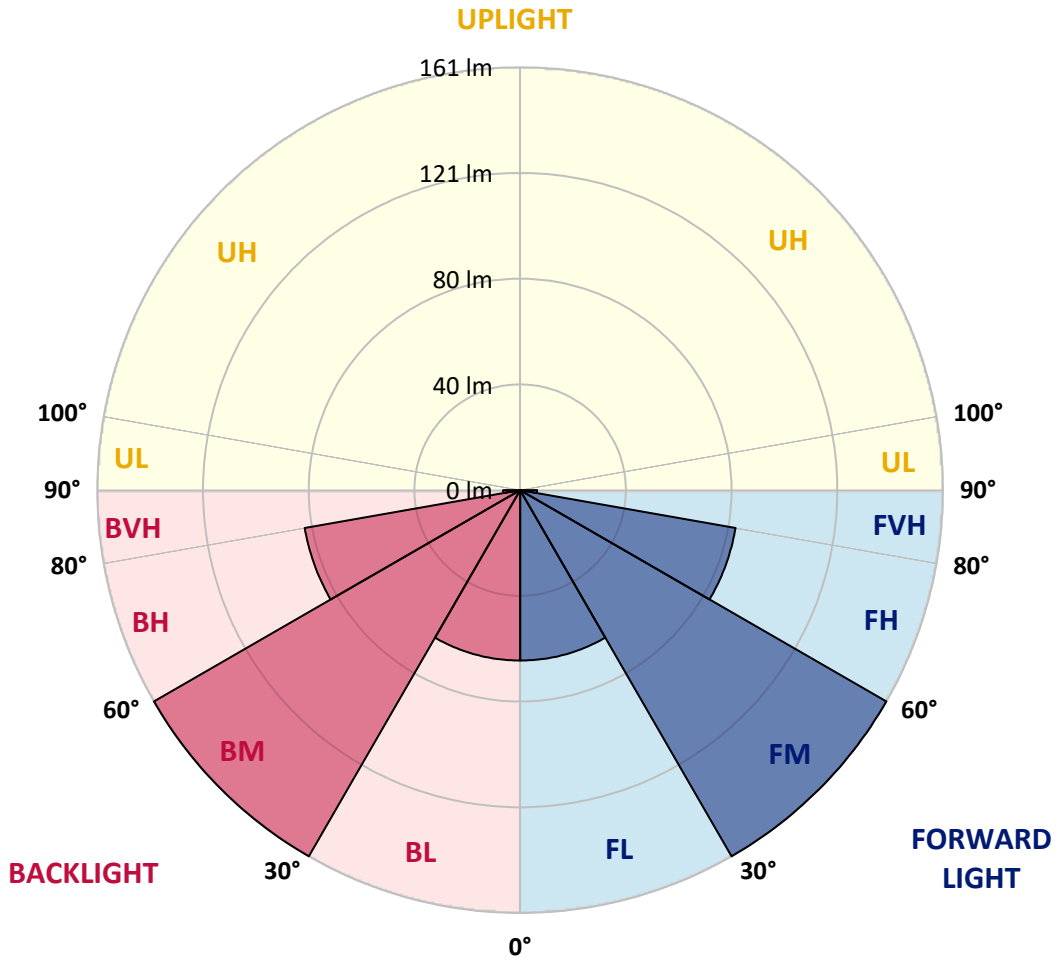
LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	64.9	10.3			
FM	(30°-60°)	160.9	25.5			
FH	(60°-80°)	83.3	13.2			G0/660
FVH	(80°-90°)	6.5	1.0			G0/10
BL	(0°-30°)	64.9	10.3	B0/110		
BM	(30°-60°)	160.9	25.5	B0/220		
BH	(60°-80°)	83.3	13.2	B0/110		G0/110
BVH	(80°-90°)	6.5	1.0			G0/10
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B0-U0-G0
Type I Short



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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7
2.5°	156.7	156.7	156.7	156.7	156.7	156.7	156.7	157.7	157.7	157.7	157.7
5°	155.7	155.7	155.7	155.7	155.7	155.7	156.7	156.7	156.7	156.7	156.7
7.5°	153.7	153.7	153.7	154.7	154.7	155.7	156.7	157.7	157.7	157.7	157.7
10°	151.7	151.7	151.7	152.7	153.7	155.7	156.7	157.7	157.7	158.7	158.7
12.5°	150.7	149.8	150.7	150.7	151.7	153.7	155.7	157.7	158.7	160.7	160.7
15°	147.8	147.8	147.8	148.8	149.8	151.7	154.7	158.7	160.7	161.7	162.6
17.5°	146.8	145.8	146.8	146.8	147.8	150.7	153.7	158.7	161.7	163.6	164.6
20°	145.8	145.8	145.8	146.8	146.8	149.8	153.7	159.7	163.6	166.6	166.6
22.5°	145.8	145.8	145.8	145.8	146.8	149.8	152.7	159.7	166.6	170.6	170.6
25°	144.8	144.8	143.8	145.8	147.8	149.8	152.7	159.7	168.6	174.5	174.5
27.5°	140.8	140.8	140.8	143.8	147.8	151.7	153.7	160.7	171.6	178.5	179.5
30°	132.9	132.9	134.9	139.8	147.8	153.7	155.7	161.7	174.5	184.5	185.5
32.5°	125.0	125.0	126.9	133.9	144.8	155.7	159.7	165.6	179.5	191.4	193.4
35°	113.1	113.1	116.0	125.0	138.8	156.7	164.6	168.6	184.5	199.3	202.3
37.5°	102.1	102.1	106.1	115.0	130.9	153.7	169.6	173.6	190.4	207.3	209.3
40°	90.2	90.2	95.2	104.1	122.0	147.8	172.6	179.5	196.4	216.2	218.2
42.5°	77.4	78.3	83.3	94.2	112.1	140.8	173.6	185.5	203.3	227.1	230.1
45°	65.5	66.4	71.4	82.3	101.2	131.9	170.6	193.4	212.2	242.0	244.0
47.5°	54.5	55.5	60.5	71.4	91.2	123.0	166.6	199.3	222.1	258.8	261.8
50°	45.6	46.6	50.6	61.5	80.3	112.1	159.7	202.3	232.1	279.7	285.6
52.5°	37.7	38.7	41.7	51.6	69.4	101.2	151.7	203.3	241.0	303.5	314.4
55°	31.7	31.7	34.7	42.6	58.5	88.3	141.8	202.3	246.9	328.3	347.1
57.5°	26.8	26.8	28.8	35.7	48.6	76.4	130.9	201.3	248.9	351.1	377.8
60°	22.8	22.8	24.8	29.8	40.7	63.5	116.0	201.3	246.9	364.0	395.7
62.5°	20.8	20.8	21.8	24.8	33.7	52.6	100.2	196.4	241.0	367.9	411.6
65°	17.9	17.9	18.8	21.8	27.8	42.6	83.3	185.5	232.1	366.9	417.5
67.5°	14.9	14.9	16.9	18.8	22.8	33.7	65.5	168.6	220.2	335.2	394.7
70°	11.9	11.9	13.9	15.9	18.8	26.8	49.6	133.9	195.4	290.6	352.1
72.5°	10.9	10.9	11.9	13.9	15.9	21.8	36.7	98.2	170.6	245.0	299.5
75°	8.9	8.9	9.9	11.9	12.9	16.9	25.8	65.5	137.9	192.4	223.1
77.5°	8.9	8.9	8.9	9.9	10.9	12.9	17.9	39.7	100.2	140.8	156.7
80°	8.9	8.9	7.9	7.9	8.9	9.9	11.9	22.8	65.5	98.2	105.1
82.5°	7.9	7.9	6.9	6.9	6.9	7.9	8.9	13.9	39.7	61.5	60.5
85°	5.0	5.0	6.0	5.0	5.0	6.0	6.0	7.9	21.8	36.7	32.7
87.5°	2.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	10.9	14.9	12.9
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Peachtree City, GA 30269

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-1

Test Date: 08/06/2024

Luminaire Tested: MEM2-HTN-SA-45-AMB-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-45-AMB-U-5WQ-2

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

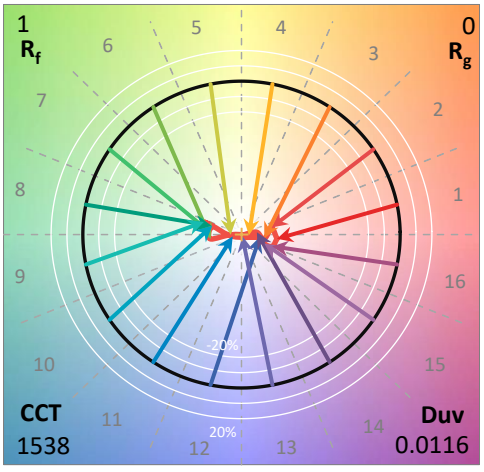
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-157-1
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	08/20/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	Streetworks
Catalog Number:	**MEM2-HTN-SA-45-AMB-U-5WQ-2**
Description:	Epic Modern Light Square 45W 5WQ Optic and Flare Trim AMBER LED

Spectral Parameters

CCT (K):	1538
CIE u':	0.3530
CIE v':	0.5469
Duv:	0.0116
CIE x:	0.5918
CIE y:	0.4076
CIE z:	0.0006
Peak Wavelength (nm):	597
Dominant Wavelength (nm):	592
Purity:	99.98881
Rf:	1.1
Rg:	0

CRI (Ra):	-21.8				
R1:	-34.3	R9:	-386.6		
R2:	52.3	R10:	28.9		
R3:	17.0	R11:	-95.5		
R4:	-68.4	R12:	-10.5		
R5:	-40.8	R13:	-15.5		
R6:	41.5	R14:	45.9		
R7:	-7.2	R15:	-67.7		
R8:	-134.5				



Test Conditions

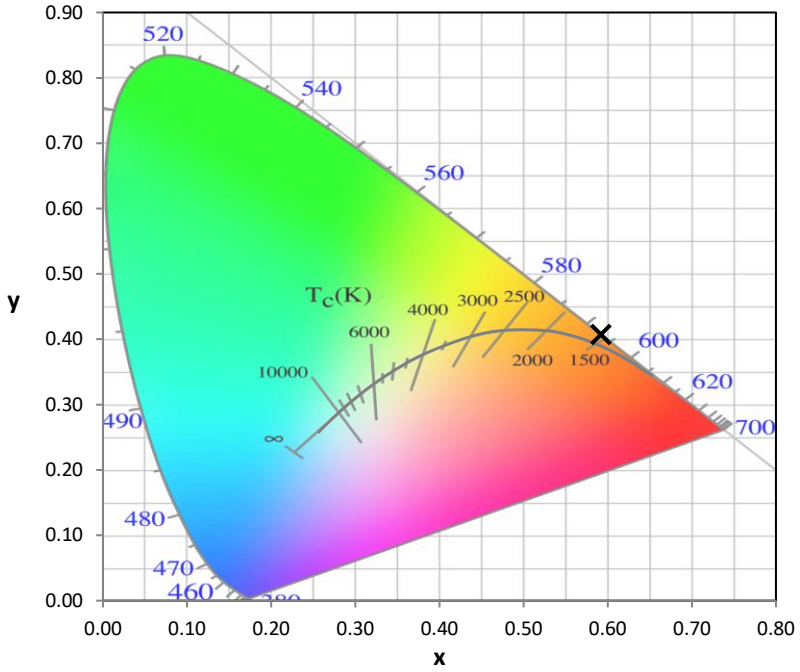
Stabilization Time:	20M
Operation Time:	1H 20M
Sphere Temperature (°C):	24.2

REPORT NUMBER: SP1-2407-157-1

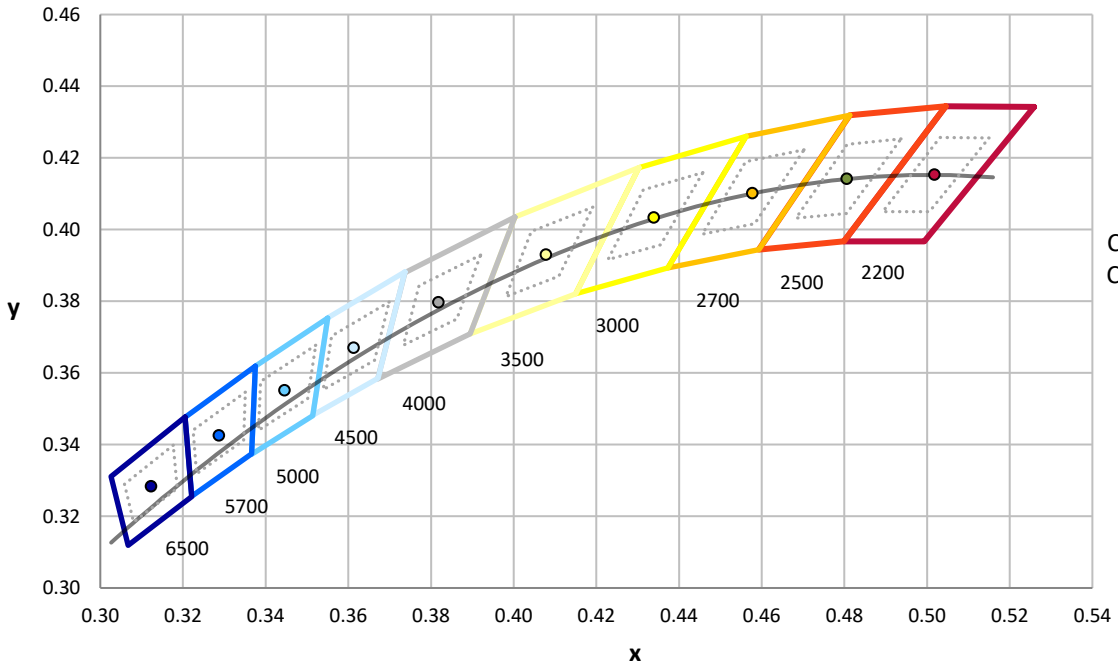
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085	10/24/2023	10/24/2024
Room Thermometer	IN0046	10/24/2023	10/24/2024

REPORT NUMBER: SP1-2407-157-1

CIE 1931 Chromaticity Diagram



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

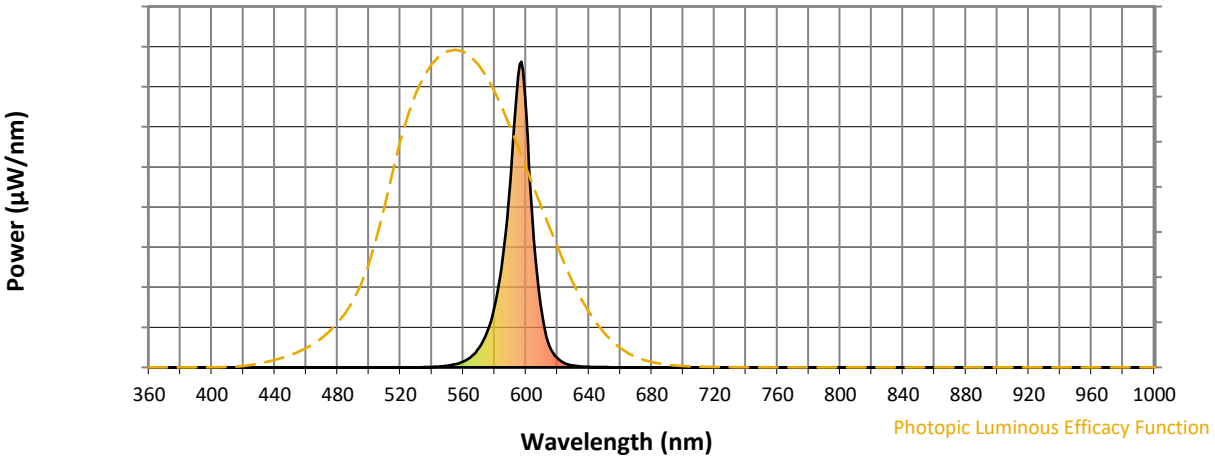


CCT = 1538K
CIE x = 0.5918
CIE y = 0.4076
Duv = 0.0116

Point lies outside the range

REPORT NUMBER: SP1-2407-157-1

Photopic Flux vs. Wavelength

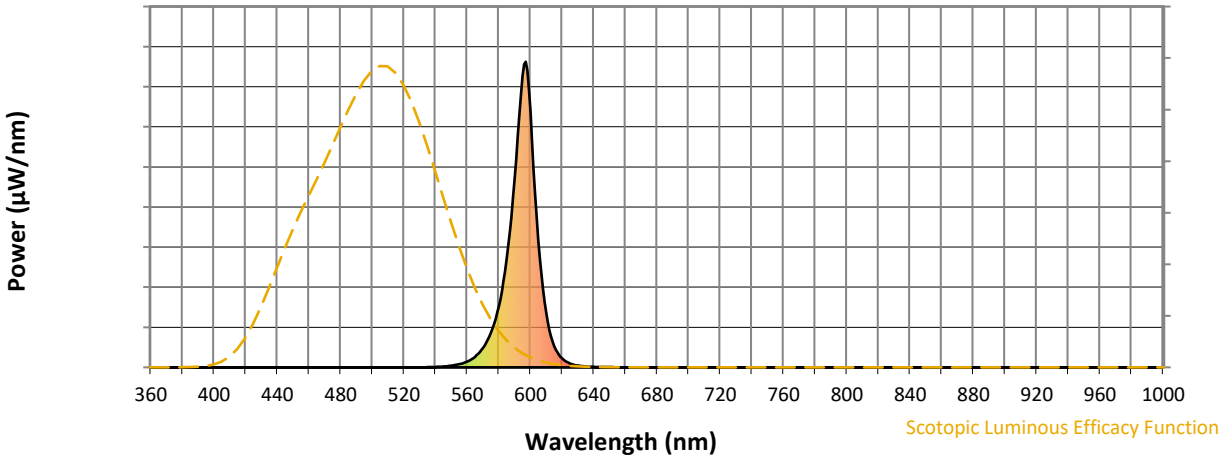


Photopic Lumens: NR

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	0	NR	620	30	NR	750	0	NR	880	0	NR
365	0	NR	495	0	NR	625	13	NR	755	0	NR	885	0	NR
370	0	NR	500	0	NR	630	6	NR	760	0	NR	890	0	NR
375	0	NR	505	0	NR	635	3	NR	765	0	NR	895	0	NR
380	0	NR	510	0	NR	640	2	NR	770	0	NR	900	0	NR
385	0	NR	515	0	NR	645	1	NR	775	0	NR	905	0	NR
390	0	NR	520	0	NR	650	1	NR	780	0	NR	910	0	NR
395	0	NR	525	0	NR	655	0	NR	785	0	NR	915	0	NR
400	0	NR	530	0	NR	660	0	NR	790	0	NR	920	0	NR
405	0	NR	535	1	NR	665	0	NR	795	0	NR	925	0	NR
410	0	NR	540	1	NR	670	0	NR	800	0	NR	930	0	NR
415	0	NR	545	3	NR	675	0	NR	805	0	NR	935	0	NR
420	0	NR	550	5	NR	680	0	NR	810	0	NR	940	0	NR
425	0	NR	555	10	NR	685	0	NR	815	0	NR	945	0	NR
430	0	NR	560	19	NR	690	0	NR	820	0	NR	950	0	NR
435	0	NR	565	34	NR	695	0	NR	825	0	NR	955	0	NR
440	0	NR	570	63	NR	700	0	NR	830	0	NR	960	0	NR
445	0	NR	575	113	NR	705	0	NR	835	0	NR	965	0	NR
450	0	NR	580	199	NR	710	0	NR	840	0	NR	970	0	NR
455	0	NR	585	352	NR	715	0	NR	845	0	NR	975	0	NR
460	0	NR	590	614	NR	720	0	NR	850	0	NR	980	0	NR
465	0	NR	595	954	NR	725	0	NR	855	0	NR	985	0	NR
470	0	NR	600	837	NR	730	0	NR	860	0	NR	990	0	NR
475	0	NR	605	417	NR	735	0	NR	865	0	NR	995	0	NR
480	0	NR	610	179	NR	740	0	NR	870	0	NR	1000	0	NR
485	0	NR	615	69	NR	745	0	NR	875	0	NR			

REPORT NUMBER: SP1-2407-157-1

Scotopic Flux vs. Wavelength

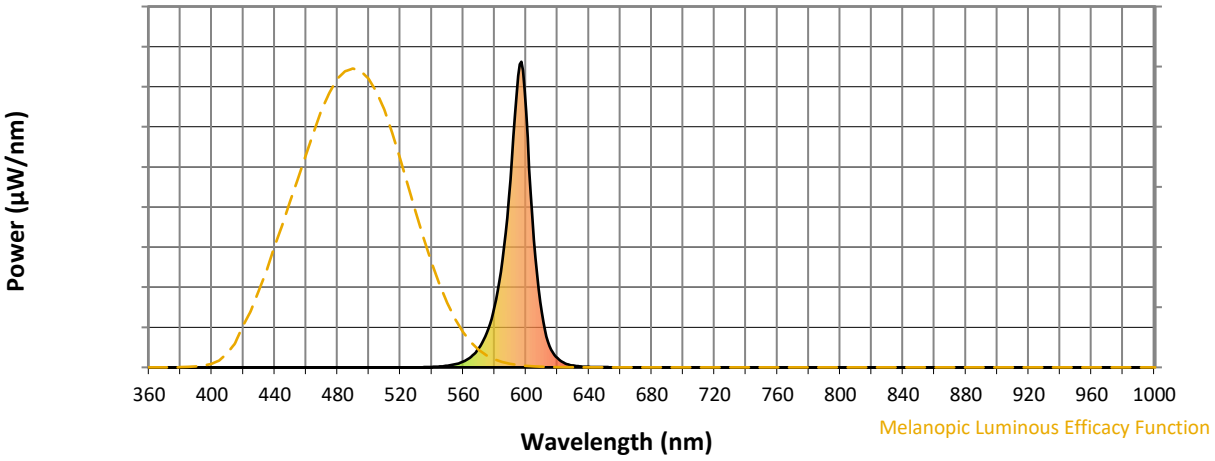


Scotopic Lumens: NR **S/P: 0.22**

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	0	NR	620	30	NR	750	0	NR	880	0	NR
365	0	NR	495	0	NR	625	13	NR	755	0	NR	885	0	NR
370	0	NR	500	0	NR	630	6	NR	760	0	NR	890	0	NR
375	0	NR	505	0	NR	635	3	NR	765	0	NR	895	0	NR
380	0	NR	510	0	NR	640	2	NR	770	0	NR	900	0	NR
385	0	NR	515	0	NR	645	1	NR	775	0	NR	905	0	NR
390	0	NR	520	0	NR	650	1	NR	780	0	NR	910	0	NR
395	0	NR	525	0	NR	655	0	NR	785	0	NR	915	0	NR
400	0	NR	530	0	NR	660	0	NR	790	0	NR	920	0	NR
405	0	NR	535	1	NR	665	0	NR	795	0	NR	925	0	NR
410	0	NR	540	1	NR	670	0	NR	800	0	NR	930	0	NR
415	0	NR	545	3	NR	675	0	NR	805	0	NR	935	0	NR
420	0	NR	550	5	NR	680	0	NR	810	0	NR	940	0	NR
425	0	NR	555	10	NR	685	0	NR	815	0	NR	945	0	NR
430	0	NR	560	19	NR	690	0	NR	820	0	NR	950	0	NR
435	0	NR	565	34	NR	695	0	NR	825	0	NR	955	0	NR
440	0	NR	570	63	NR	700	0	NR	830	0	NR	960	0	NR
445	0	NR	575	113	NR	705	0	NR	835	0	NR	965	0	NR
450	0	NR	580	199	NR	710	0	NR	840	0	NR	970	0	NR
455	0	NR	585	352	NR	715	0	NR	845	0	NR	975	0	NR
460	0	NR	590	614	NR	720	0	NR	850	0	NR	980	0	NR
465	0	NR	595	954	NR	725	0	NR	855	0	NR	985	0	NR
470	0	NR	600	837	NR	730	0	NR	860	0	NR	990	0	NR
475	0	NR	605	417	NR	735	0	NR	865	0	NR	995	0	NR
480	0	NR	610	179	NR	740	0	NR	870	0	NR	1000	0	NR
485	0	NR	615	69	NR	745	0	NR	875	0	NR			

REPORT NUMBER: SP1-2407-157-1

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 0.12**

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	0	NR	620	30	NR	750	0	NR	880	0	NR
365	0	NR	495	0	NR	625	13	NR	755	0	NR	885	0	NR
370	0	NR	500	0	NR	630	6	NR	760	0	NR	890	0	NR
375	0	NR	505	0	NR	635	3	NR	765	0	NR	895	0	NR
380	0	NR	510	0	NR	640	2	NR	770	0	NR	900	0	NR
385	0	NR	515	0	NR	645	1	NR	775	0	NR	905	0	NR
390	0	NR	520	0	NR	650	1	NR	780	0	NR	910	0	NR
395	0	NR	525	0	NR	655	0	NR	785	0	NR	915	0	NR
400	0	NR	530	0	NR	660	0	NR	790	0	NR	920	0	NR
405	0	NR	535	1	NR	665	0	NR	795	0	NR	925	0	NR
410	0	NR	540	1	NR	670	0	NR	800	0	NR	930	0	NR
415	0	NR	545	3	NR	675	0	NR	805	0	NR	935	0	NR
420	0	NR	550	5	NR	680	0	NR	810	0	NR	940	0	NR
425	0	NR	555	10	NR	685	0	NR	815	0	NR	945	0	NR
430	0	NR	560	19	NR	690	0	NR	820	0	NR	950	0	NR
435	0	NR	565	34	NR	695	0	NR	825	0	NR	955	0	NR
440	0	NR	570	63	NR	700	0	NR	830	0	NR	960	0	NR
445	0	NR	575	113	NR	705	0	NR	835	0	NR	965	0	NR
450	0	NR	580	199	NR	710	0	NR	840	0	NR	970	0	NR
455	0	NR	585	352	NR	715	0	NR	845	0	NR	975	0	NR
460	0	NR	590	614	NR	720	0	NR	850	0	NR	980	0	NR
465	0	NR	595	954	NR	725	0	NR	855	0	NR	985	0	NR
470	0	NR	600	837	NR	730	0	NR	860	0	NR	990	0	NR
475	0	NR	605	417	NR	735	0	NR	865	0	NR	995	0	NR
480	0	NR	610	179	NR	740	0	NR	870	0	NR	1000	0	NR
485	0	NR	615	69	NR	745	0	NR	875	0	NR			

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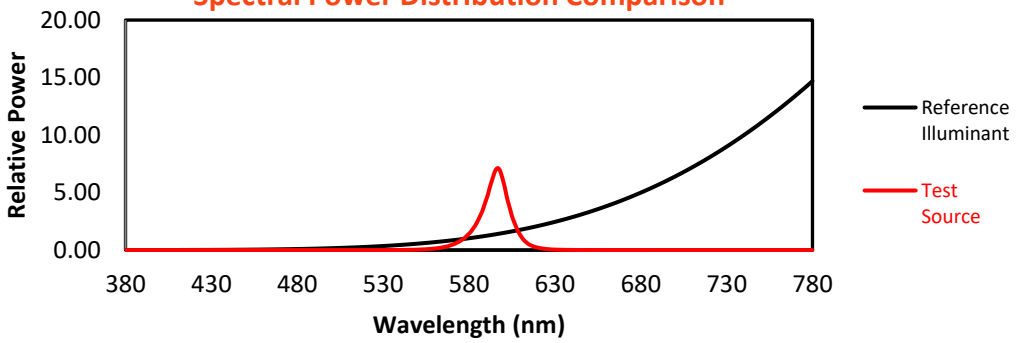
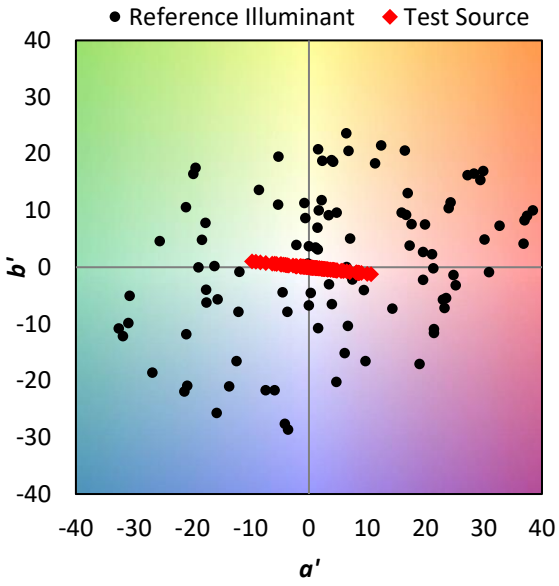
Summary

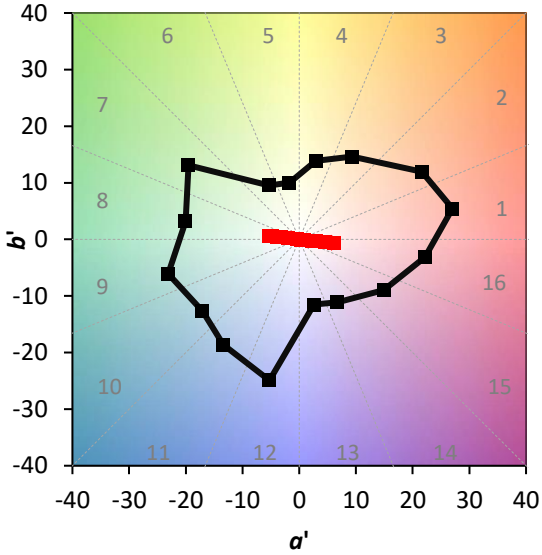
R_f = 1.1
R_g = 0
CIE R_a = -21.8
R_9 = -386.6

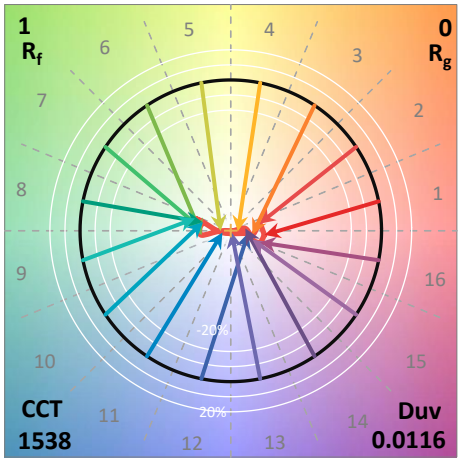
Spectral Power Distribution Comparison

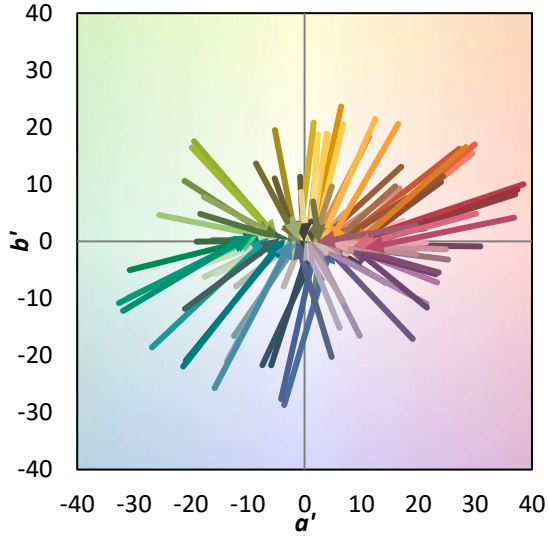


Color Vector Graphics









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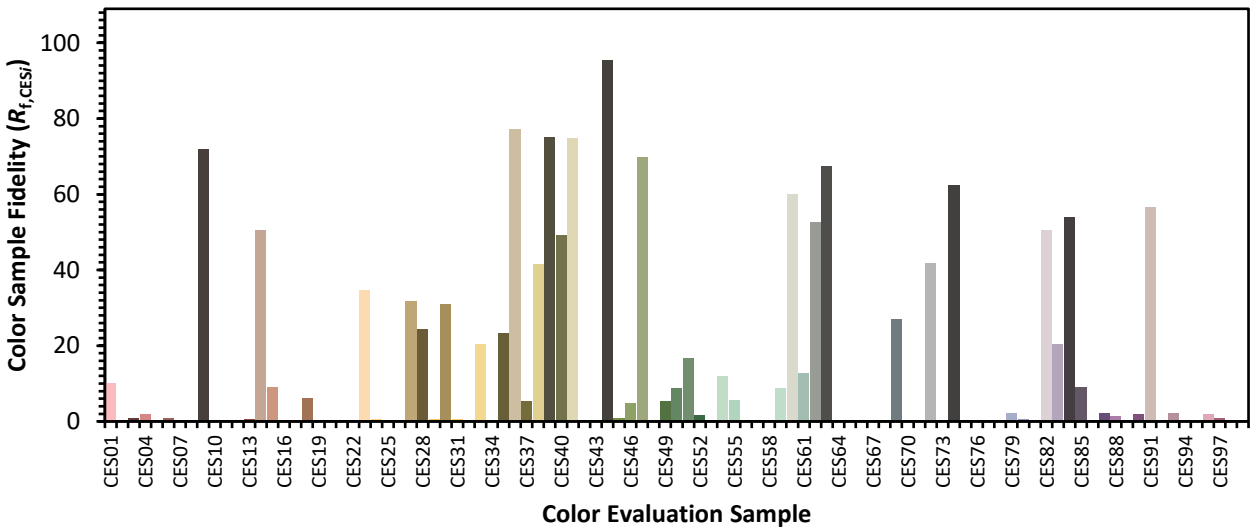
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 90	CES26 = 0	CES51 = 17	CES76 = 0
CES02 = 70	CES27 = 32	CES52 = 2	CES77 = 0
CES03 = 31	CES28 = 24	CES53 = 0	CES78 = 0
CES04 = 77	CES29 = 1	CES54 = 12	CES79 = 2
CES05 = 52	CES30 = 31	CES55 = 6	CES80 = 1
CES06 = 56	CES31 = 1	CES56 = 0	CES81 = 0
CES07 = 41	CES32 = 0	CES57 = 0	CES82 = 50
CES08 = 38	CES33 = 21	CES58 = 0	CES83 = 21
CES09 = 29	CES34 = 0	CES59 = 9	CES84 = 54
CES10 = 87	CES35 = 23	CES60 = 60	CES85 = 9
CES11 = 70	CES36 = 77	CES61 = 13	CES86 = 0
CES12 = 76	CES37 = 5	CES62 = 53	CES87 = 2
CES13 = 47	CES38 = 41	CES63 = 68	CES88 = 1
CES14 = 77	CES39 = 75	CES64 = 0	CES89 = 0
CES15 = 74	CES40 = 49	CES65 = 0	CES90 = 2
CES16 = 49	CES41 = 75	CES66 = 0	CES91 = 57
CES17 = 56	CES42 = 0	CES67 = 0	CES92 = 0
CES18 = 60	CES43 = 0	CES68 = 0	CES93 = 2
CES19 = 80	CES44 = 95	CES69 = 27	CES94 = 0
CES20 = 71	CES45 = 1	CES70 = 0	CES95 = 0
CES21 = 94	CES46 = 5	CES71 = 0	CES96 = 2
CES22 = 87	CES47 = 70	CES72 = 42	CES97 = 1
CES23 = 94	CES48 = 0	CES73 = 0	CES98 = 0
CES24 = 95	CES49 = 5	CES74 = 62	CES99 = 0
CES25 = 79	CES50 = 9	CES75 = 0	



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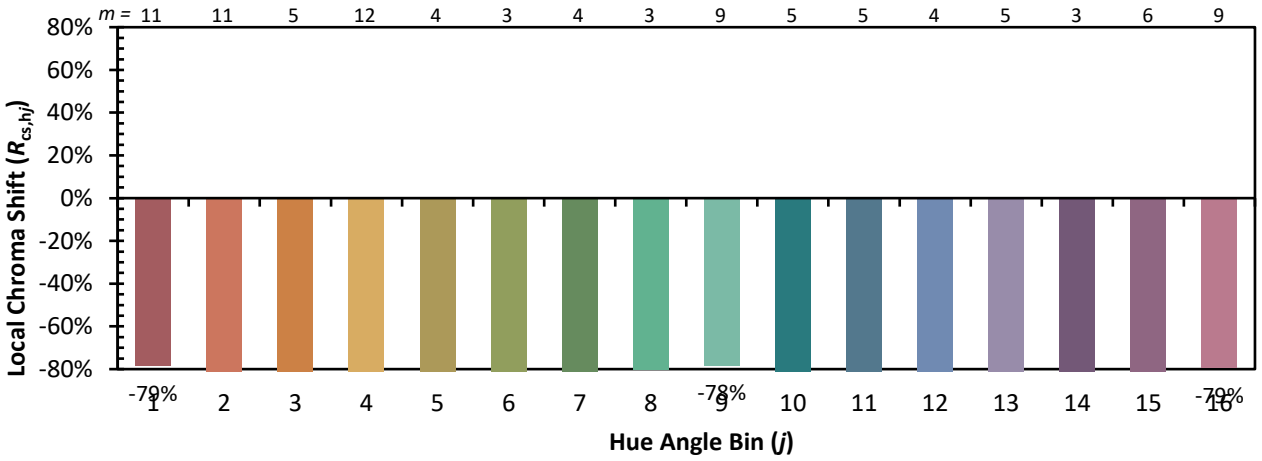
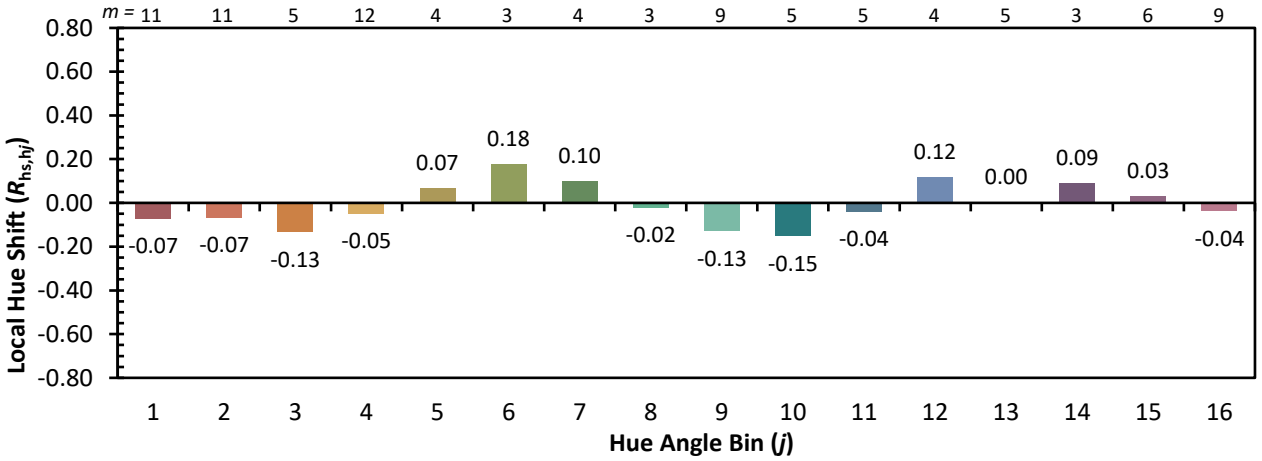
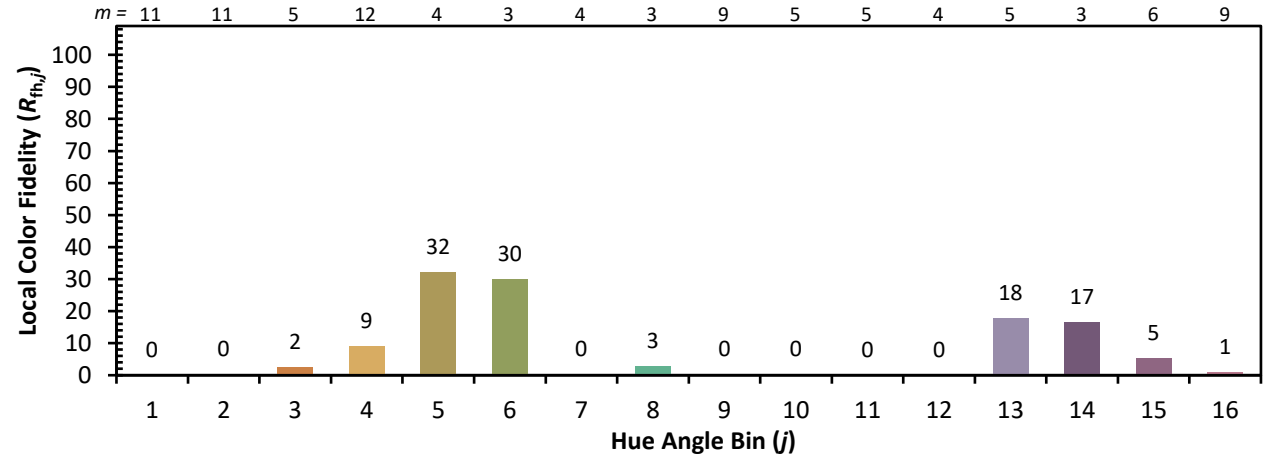
Color Rendition by Hue-Angle Bin







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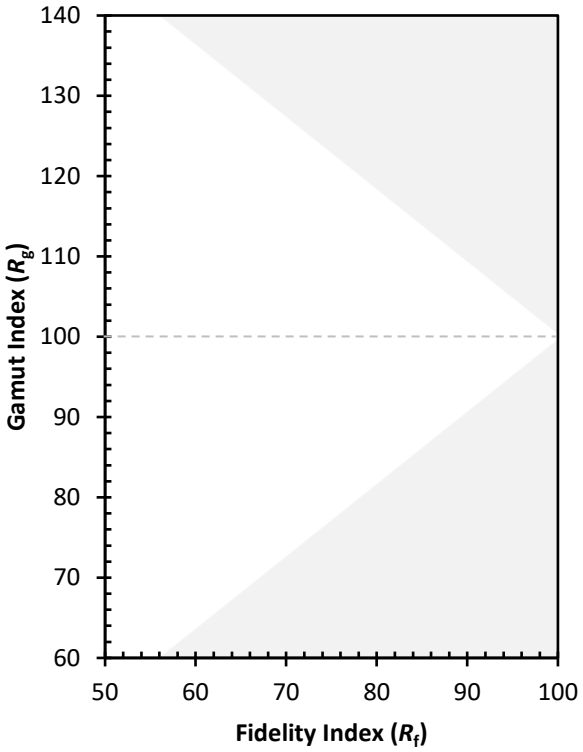
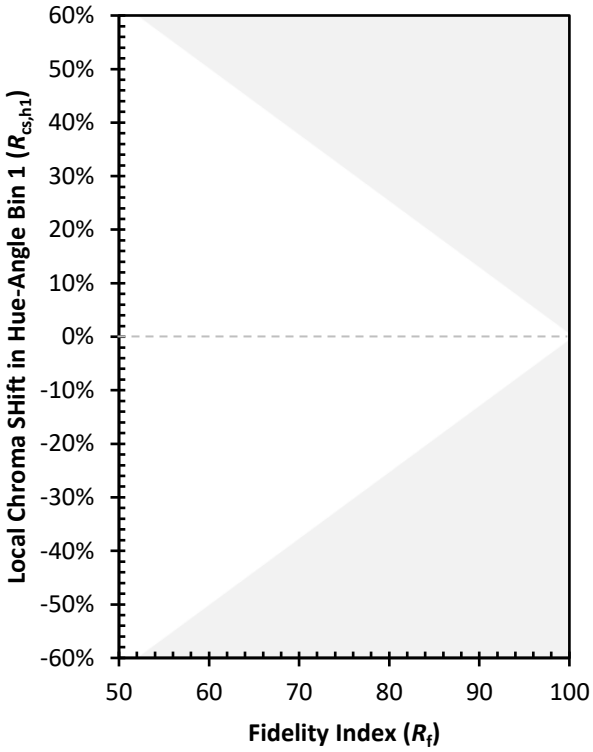
Measure Comparisons





(END OF REPORT)