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: P880469

Luminaire Tested: **EMM2-HSN-VA4-727-U-CQ**

Issue Date: 10/01/2024

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:	P880469
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	10/01/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HSN-VA4-727-U-CQ
Description:	EPIC MODERN SHORT HOUSING 4W 70CRI 2700K VISUAL COMFORT FIXTURE w/ TYPE V CONCENTRATED DISTRIBUTION OPTIC
Light Source:	(1) 2700K CCT, 70 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	4601.5 lumens
Efficiency:	N/A
Efficacy:	78.0 lumens/watt
Luminous Opening:	Circular (Dia: 1.12' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B2 - U0 - G1

Input Watts (W):	59
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.99
Total Harmonic Distortion (THDi):	9%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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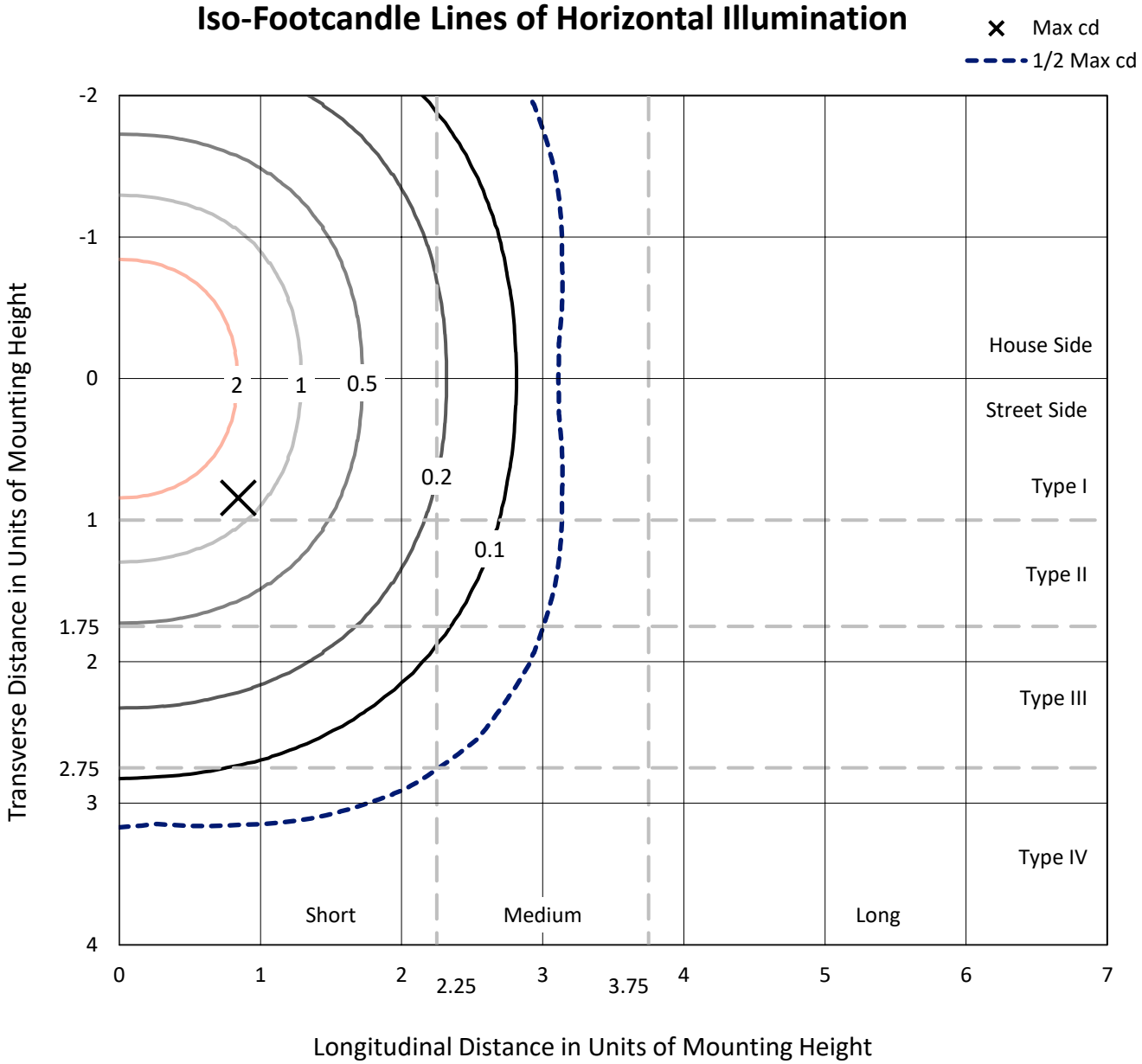
REPORT NUMBER: P880469
CATALOG NUMBER: EMM2-HSN-VA4-727-U-CQ

Iso-Footcandle Lines of Horizontal Illumination



Based on 15 foot mounting height. Maximum calculated value = 4.6 fc
Type V - Short - N/A

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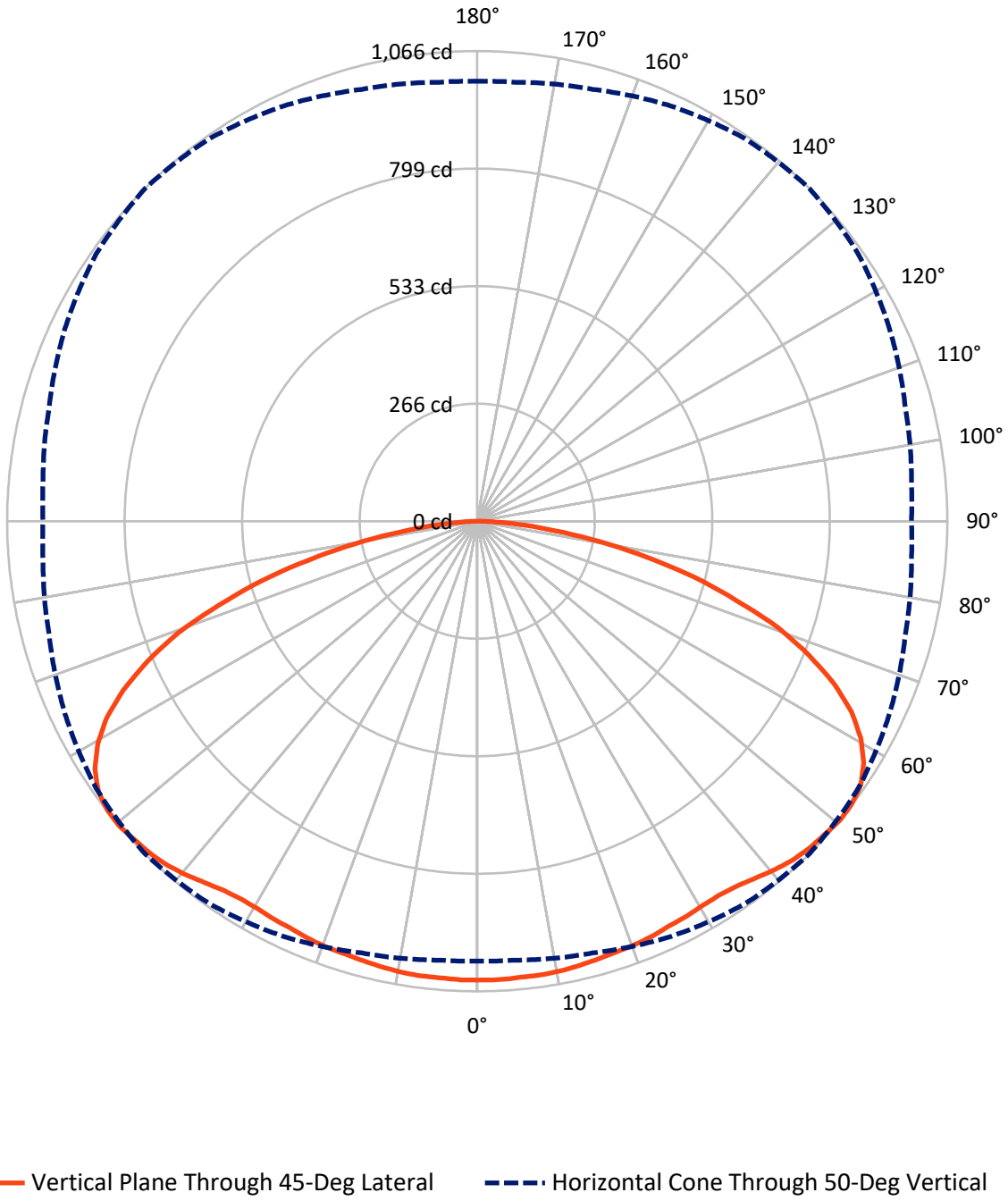
Luminous Intensity Polar Plot



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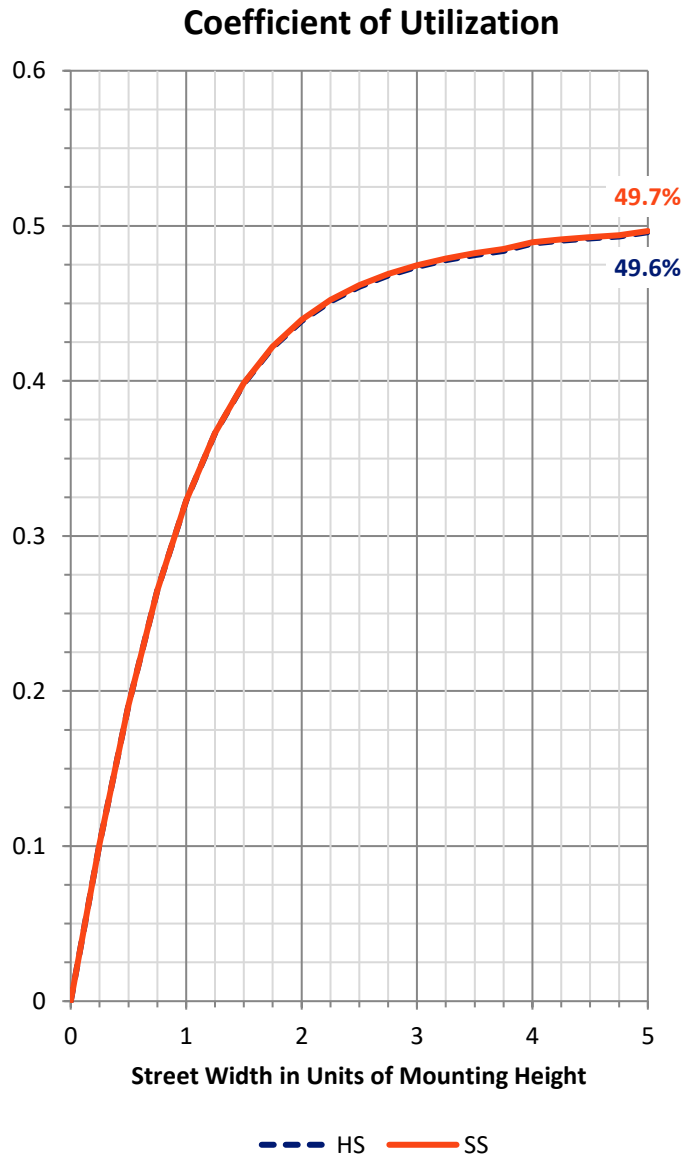
REPORT NUMBER: P880469
CATALOG NUMBER: EMM2-HSN-VA4-727-U-CQ

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	2300.7	0.0	2300.7
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	2300.7	0.0	2300.7
	% Fixture	50.0	0.0	50.0
Total	Lumens	4601.5	0.0	4601.5
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	99.1	2.2
10°-20°	291.5	6.3
20°-30°	469.0	10.2
30°-40°	633.2	13.8
40°-50°	796.0	17.3
50°-60°	894.8	19.4
60°-70°	814.8	17.7
70°-80°	492.0	10.7
80°-90°	110.9	2.4
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°	4601.5	100.0
0°-180°	4601.5	100.0



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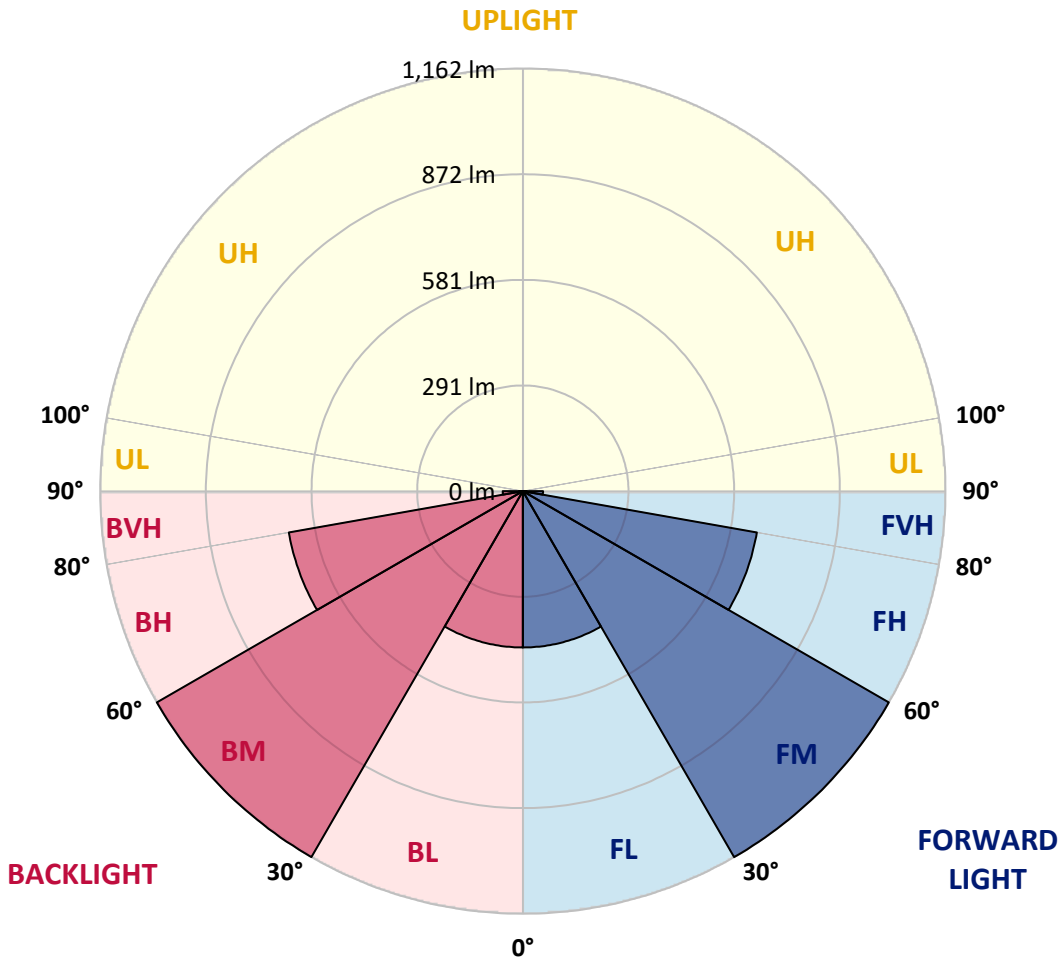
REPORT NUMBER: P880469
CATALOG NUMBER: EMM2-HSN-VA4-727-U-CQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	429.8	9.3			
FM	(30°-60°)	1162.0	25.3			
FH	(60°-80°)	653.4	14.2			G0/660
FVH	(80°-90°)	55.5	1.2			G1/100
BL	(0°-30°)	429.8	9.3	B1/500		
BM	(30°-60°)	1162.0	25.3	B2/2500		
BH	(60°-80°)	653.4	14.2	B2/1000		G0/660
BVH	(80°-90°)	55.5	1.2			G1/100
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B2-U0-G1
Type V Short



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REPORT NUMBER: P880469
CATALOG NUMBER: EMM2-HSN-VA4-727-U-CQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4
2.5°	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4	1040.4
5°	1038.6	1038.6	1038.6	1038.6	1038.6	1038.6	1038.6	1038.6	1038.6	1038.6	1040.4
7.5°	1036.8	1038.6	1038.6	1036.8	1038.6	1038.6	1038.6	1038.6	1038.6	1038.6	1038.6
10°	1035.0	1035.0	1036.8	1036.8	1036.8	1036.8	1036.8	1036.8	1036.8	1036.8	1035.0
12.5°	1031.4	1033.2	1033.2	1033.2	1033.2	1033.2	1033.2	1033.2	1033.2	1033.2	1033.2
15°	1029.6	1029.6	1029.6	1029.6	1029.6	1029.6	1029.6	1029.6	1027.8	1027.8	1029.6
17.5°	1024.2	1024.2	1026.0	1026.0	1026.0	1026.0	1026.0	1026.0	1024.2	1024.2	1024.2
20°	1020.6	1020.6	1022.4	1022.4	1022.4	1024.2	1022.4	1020.6	1020.6	1020.6	1020.6
22.5°	1017.0	1017.0	1018.8	1018.8	1020.6	1020.6	1018.8	1018.8	1017.0	1017.0	1017.0
25°	1013.3	1013.3	1013.3	1015.2	1017.0	1015.2	1015.2	1013.3	1011.5	1009.7	1009.7
27.5°	1007.9	1007.9	1007.9	1011.5	1011.5	1013.3	1011.5	1009.7	1006.1	1004.3	1004.3
30°	1002.5	1002.5	1004.3	1007.9	1009.7	1009.7	1007.9	1004.3	1000.7	998.9	998.9
32.5°	997.1	998.9	1000.7	1006.1	1007.9	1009.7	1006.1	1002.5	997.1	993.5	993.5
35°	997.1	997.1	1002.5	1007.9	1013.3	1015.2	1011.5	1004.3	997.1	991.7	991.7
37.5°	998.9	1000.7	1007.9	1015.2	1022.4	1026.0	1020.6	1011.5	1000.7	993.5	993.5
40°	1006.1	1006.1	1015.2	1027.8	1036.8	1038.6	1033.2	1020.6	1006.1	997.1	995.3
42.5°	1009.7	1011.5	1020.6	1035.0	1045.9	1049.5	1042.2	1027.8	1009.7	997.1	995.3
45°	1009.7	1011.5	1022.4	1038.6	1053.1	1056.7	1049.5	1031.4	1011.5	998.9	995.3
47.5°	1004.3	1006.1	1020.6	1040.4	1056.7	1060.3	1051.3	1033.2	1009.7	995.3	991.7
50°	997.1	998.9	1013.3	1038.6	1058.5	1065.7	1054.9	1031.4	1004.3	988.1	984.4
52.5°	982.6	984.4	1004.3	1031.4	1056.7	1063.9	1051.3	1026.0	993.5	975.4	971.8
55°	961.0	964.6	984.4	1017.0	1045.9	1054.9	1040.4	1011.5	977.2	955.5	951.9
57.5°	932.1	933.9	957.4	993.5	1024.2	1033.2	1018.8	988.1	950.1	926.6	924.8
60°	890.5	894.1	921.2	957.4	989.9	998.9	984.4	951.9	912.2	886.9	885.1
62.5°	839.9	843.6	868.8	910.4	942.9	951.9	937.5	903.2	863.4	836.3	834.5
65°	776.7	780.3	805.6	845.4	879.7	888.7	876.1	839.9	800.2	774.9	771.3
67.5°	706.3	709.9	733.4	767.7	798.4	811.0	798.4	767.7	729.8	699.0	695.4
70°	621.4	621.4	644.9	679.2	708.1	724.3	708.1	677.4	639.4	614.1	614.1
72.5°	532.9	529.3	550.9	583.4	606.9	614.1	610.5	583.4	547.3	523.8	520.2
75°	426.3	433.5	449.8	473.3	498.5	509.4	496.7	473.3	448.0	428.1	426.3
77.5°	330.6	336.0	350.4	370.3	384.7	392.0	388.4	370.3	343.2	334.2	330.6
80°	233.0	236.6	249.3	263.7	274.6	281.8	276.4	261.9	247.5	238.4	234.8
82.5°	151.7	149.9	160.8	169.8	178.8	177.0	175.2	164.4	159.0	151.7	149.9
85°	77.7	79.5	79.5	88.5	90.3	93.9	92.1	88.5	79.5	75.9	77.7
87.5°	25.3	25.3	27.1	27.1	30.7	30.7	32.5	28.9	27.1	23.5	23.5
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: SP1-2407-176-2

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-727-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-727-U-WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

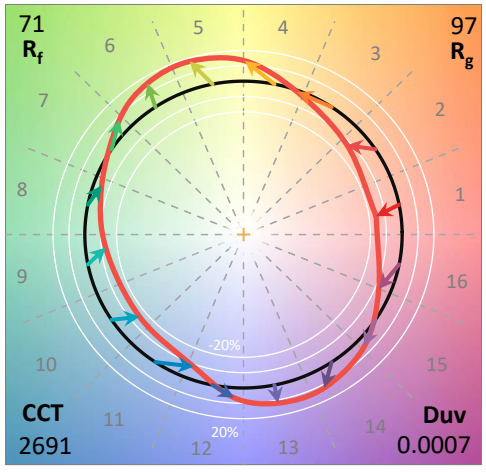
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-176-2
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	09/27/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	Streetworks
Catalog Number:	**MEM2-HTN-VA-30-727-U-WQ**
Description:	EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE

Spectral Parameters

CCT (K):	2691	CRI (Ra):	70.6		
CIE u':	0.2627	R1:	67.7	R9:	-27.1
CIE v':	0.5285	R2:	79.8	R10:	53.1
Duv:	0.0007	R3:	90.6	R11:	61.9
CIE x:	0.4618	R4:	67.7	R12:	42.2
CIE y:	0.4129	R5:	65.3	R13:	69.4
CIE z:	0.1254	R6:	71.1	R14:	94.1
Peak Wavelength (nm):	601	R7:	78.1	R15:	60.4
Dominant Wavelength (nm):	584	R8:	44.7		
Purity:	62.54863				

Rf:	70.6
Rg:	97.2



Test Conditions

Stabilization Time:	28M
Operation Time:	1H 28M
Sphere Temperature (°C):	25.2

REPORT NUMBER: SP1-2407-176-2

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

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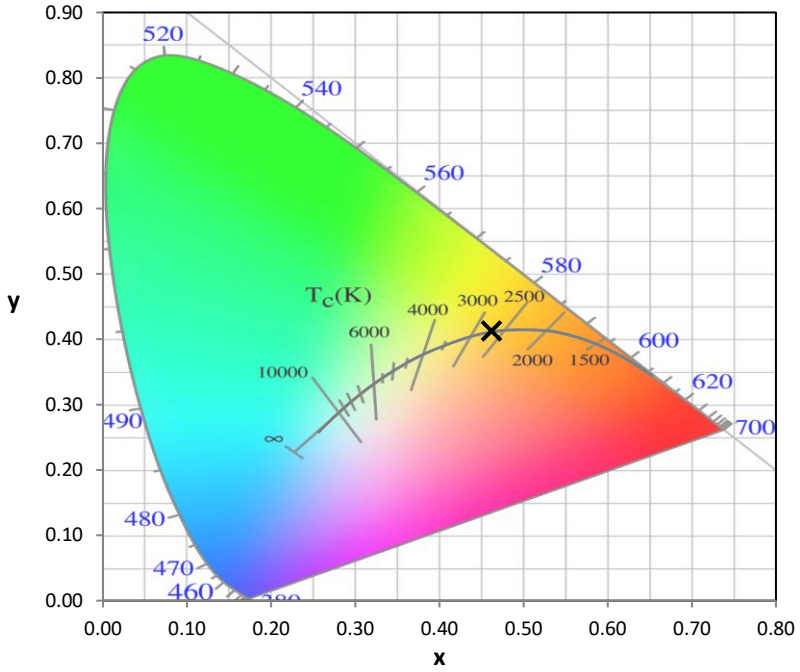
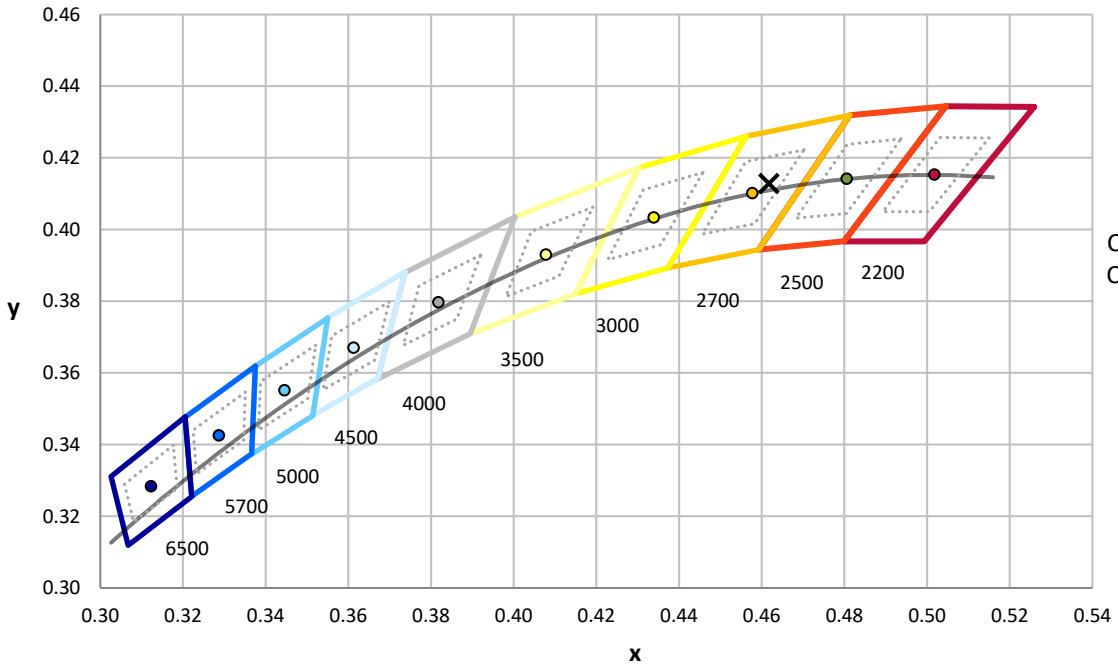
CIE 1931 Chromaticity Diagram



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



CCT = 2691K
CIE x = 0.4618
CIE y = 0.4129
Duv = 0.0007

Point lies inside the ANSI 2700K 4-step quadrangle

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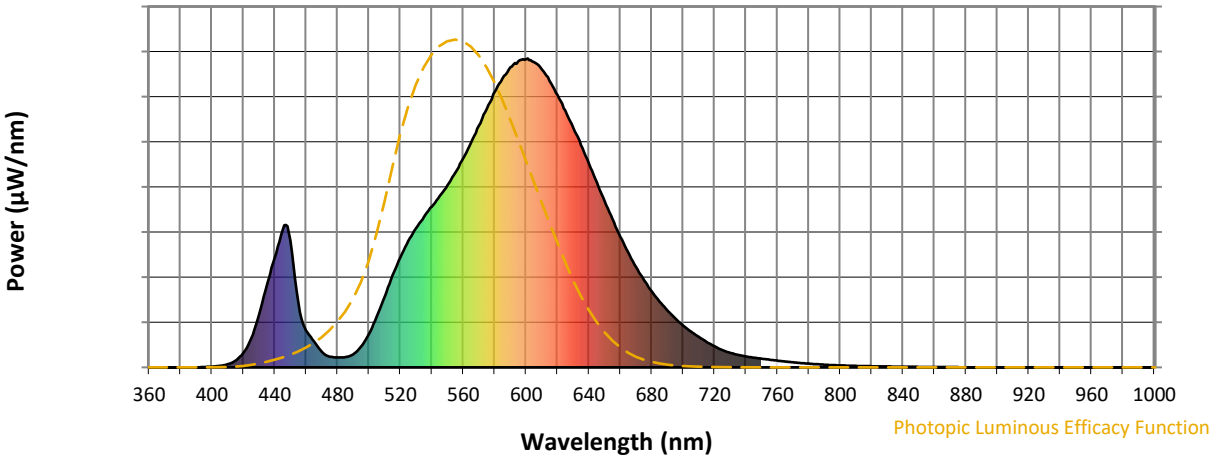
Photopic Flux vs. Wavelength

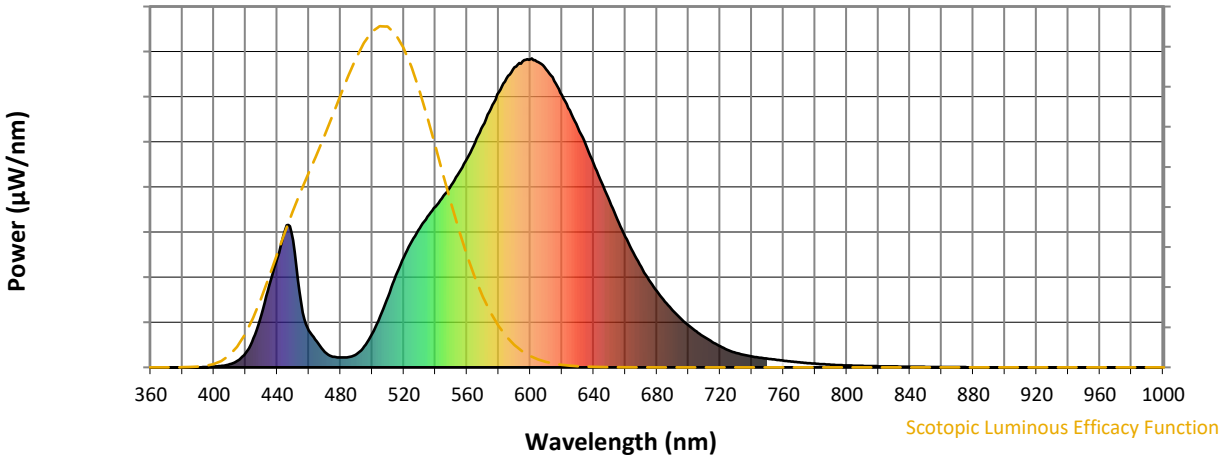


Photopic Lumens: NR

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	43	NR	620	881	NR	750	28	NR	880	0	NR
365	0	NR	495	67	NR	625	832	NR	755	25	NR	885	0	NR
370	0	NR	500	108	NR	630	776	NR	760	22	NR	890	0	NR
375	0	NR	505	165	NR	635	720	NR	765	19	NR	895	0	NR
380	0	NR	510	229	NR	640	660	NR	770	16	NR	900	0	NR
385	0	NR	515	297	NR	645	599	NR	775	14	NR	905	0	NR
390	0	NR	520	357	NR	650	538	NR	780	12	NR	910	0	NR
395	1	NR	525	408	NR	655	480	NR	785	10	NR	915	0	NR
400	3	NR	530	451	NR	660	423	NR	790	9	NR	920	0	NR
405	5	NR	535	488	NR	665	372	NR	795	7	NR	925	0	NR
410	10	NR	540	521	NR	670	325	NR	800	6	NR	930	0	NR
415	21	NR	545	555	NR	675	282	NR	805	5	NR	935	0	NR
420	46	NR	550	590	NR	680	246	NR	810	5	NR	940	0	NR
425	94	NR	555	631	NR	685	213	NR	815	4	NR	945	0	NR
430	169	NR	560	677	NR	690	185	NR	820	4	NR	950	0	NR
435	268	NR	565	728	NR	695	158	NR	825	3	NR	955	0	NR
440	354	NR	570	782	NR	700	136	NR	830	3	NR	960	0	NR
445	445	NR	575	838	NR	705	116	NR	835	2	NR	965	0	NR
450	411	NR	580	891	NR	710	98	NR	840	2	NR	970	0	NR
455	210	NR	585	935	NR	715	82	NR	845	2	NR	975	0	NR
460	119	NR	590	972	NR	720	68	NR	850	2	NR	980	0	NR
465	84	NR	595	991	NR	725	56	NR	855	1	NR	985	0	NR
470	50	NR	600	997	NR	730	47	NR	860	1	NR	990	0	NR
475	35	NR	605	988	NR	735	40	NR	865	1	NR	995	0	NR
480	32	NR	610	965	NR	740	35	NR	870	1	NR	1000	0	NR
485	33	NR	615	927	NR	745	31	NR	875	1	NR			

REPORT NUMBER: SP1-2407-176-2

Scotopic Flux vs. Wavelength

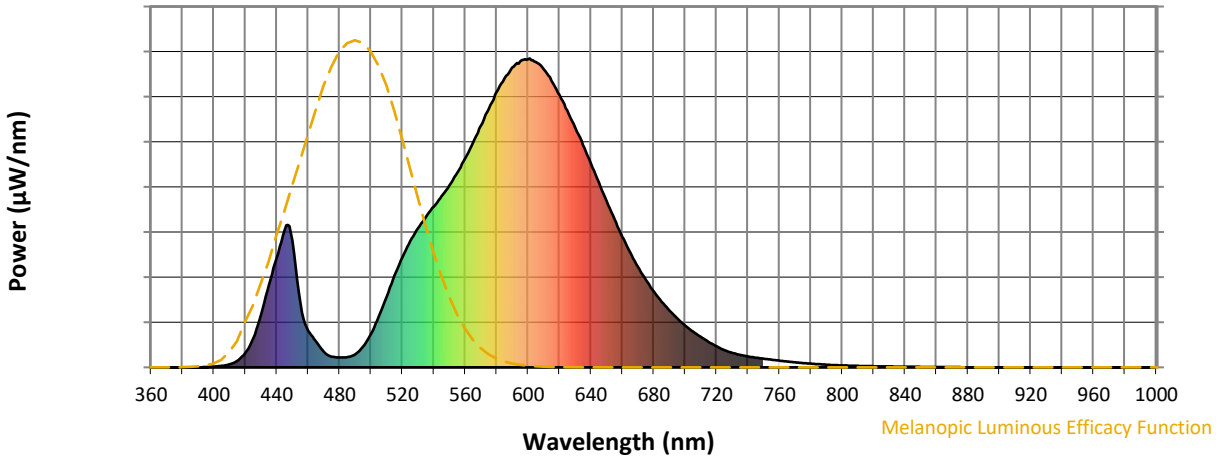


Scotopic Lumens: NR **S/P: 1.03**

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	43	NR	620	881	NR	750	28	NR	880	0	NR
365	0	NR	495	67	NR	625	832	NR	755	25	NR	885	0	NR
370	0	NR	500	108	NR	630	776	NR	760	22	NR	890	0	NR
375	0	NR	505	165	NR	635	720	NR	765	19	NR	895	0	NR
380	0	NR	510	229	NR	640	660	NR	770	16	NR	900	0	NR
385	0	NR	515	297	NR	645	599	NR	775	14	NR	905	0	NR
390	0	NR	520	357	NR	650	538	NR	780	12	NR	910	0	NR
395	1	NR	525	408	NR	655	480	NR	785	10	NR	915	0	NR
400	3	NR	530	451	NR	660	423	NR	790	9	NR	920	0	NR
405	5	NR	535	488	NR	665	372	NR	795	7	NR	925	0	NR
410	10	NR	540	521	NR	670	325	NR	800	6	NR	930	0	NR
415	21	NR	545	555	NR	675	282	NR	805	5	NR	935	0	NR
420	46	NR	550	590	NR	680	246	NR	810	5	NR	940	0	NR
425	94	NR	555	631	NR	685	213	NR	815	4	NR	945	0	NR
430	169	NR	560	677	NR	690	185	NR	820	4	NR	950	0	NR
435	268	NR	565	728	NR	695	158	NR	825	3	NR	955	0	NR
440	354	NR	570	782	NR	700	136	NR	830	3	NR	960	0	NR
445	445	NR	575	838	NR	705	116	NR	835	2	NR	965	0	NR
450	411	NR	580	891	NR	710	98	NR	840	2	NR	970	0	NR
455	210	NR	585	935	NR	715	82	NR	845	2	NR	975	0	NR
460	119	NR	590	972	NR	720	68	NR	850	2	NR	980	0	NR
465	84	NR	595	991	NR	725	56	NR	855	1	NR	985	0	NR
470	50	NR	600	997	NR	730	47	NR	860	1	NR	990	0	NR
475	35	NR	605	988	NR	735	40	NR	865	1	NR	995	0	NR
480	32	NR	610	965	NR	740	35	NR	870	1	NR	1000	0	NR
485	33	NR	615	927	NR	745	31	NR	875	1	NR			

REPORT NUMBER: SP1-2407-176-2

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 1.73**

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	43	NR	620	881	NR	750	28	NR	880	0	NR
365	0	NR	495	67	NR	625	832	NR	755	25	NR	885	0	NR
370	0	NR	500	108	NR	630	776	NR	760	22	NR	890	0	NR
375	0	NR	505	165	NR	635	720	NR	765	19	NR	895	0	NR
380	0	NR	510	229	NR	640	660	NR	770	16	NR	900	0	NR
385	0	NR	515	297	NR	645	599	NR	775	14	NR	905	0	NR
390	0	NR	520	357	NR	650	538	NR	780	12	NR	910	0	NR
395	1	NR	525	408	NR	655	480	NR	785	10	NR	915	0	NR
400	3	NR	530	451	NR	660	423	NR	790	9	NR	920	0	NR
405	5	NR	535	488	NR	665	372	NR	795	7	NR	925	0	NR
410	10	NR	540	521	NR	670	325	NR	800	6	NR	930	0	NR
415	21	NR	545	555	NR	675	282	NR	805	5	NR	935	0	NR
420	46	NR	550	590	NR	680	246	NR	810	5	NR	940	0	NR
425	94	NR	555	631	NR	685	213	NR	815	4	NR	945	0	NR
430	169	NR	560	677	NR	690	185	NR	820	4	NR	950	0	NR
435	268	NR	565	728	NR	695	158	NR	825	3	NR	955	0	NR
440	354	NR	570	782	NR	700	136	NR	830	3	NR	960	0	NR
445	445	NR	575	838	NR	705	116	NR	835	2	NR	965	0	NR
450	411	NR	580	891	NR	710	98	NR	840	2	NR	970	0	NR
455	210	NR	585	935	NR	715	82	NR	845	2	NR	975	0	NR
460	119	NR	590	972	NR	720	68	NR	850	2	NR	980	0	NR
465	84	NR	595	991	NR	725	56	NR	855	1	NR	985	0	NR
470	50	NR	600	997	NR	730	47	NR	860	1	NR	990	0	NR
475	35	NR	605	988	NR	735	40	NR	865	1	NR	995	0	NR
480	32	NR	610	965	NR	740	35	NR	870	1	NR	1000	0	NR
485	33	NR	615	927	NR	745	31	NR	875	1	NR			

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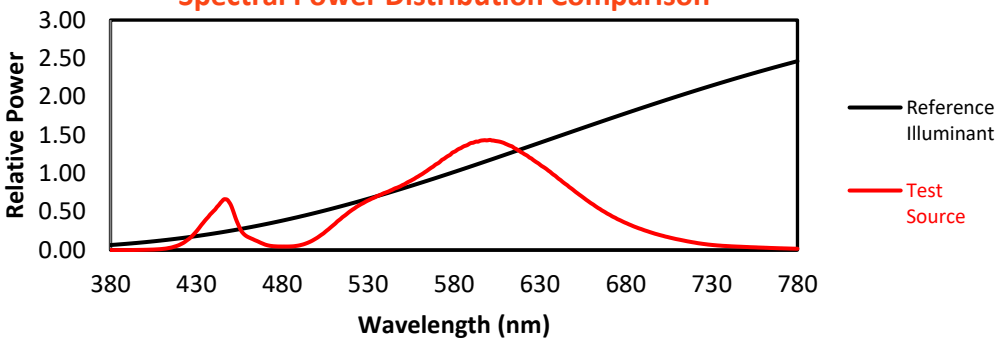
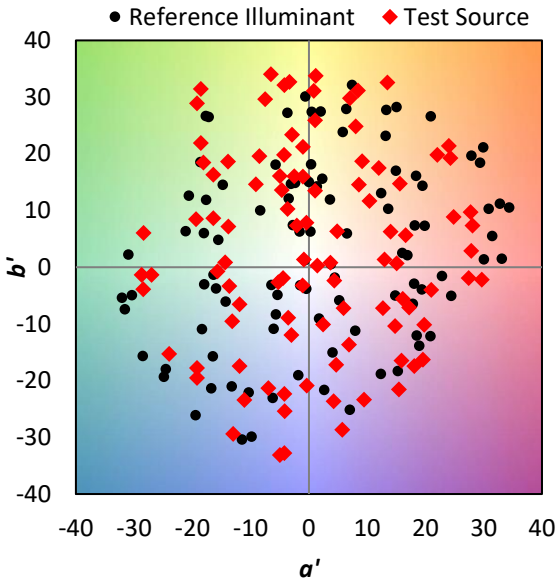
Summary

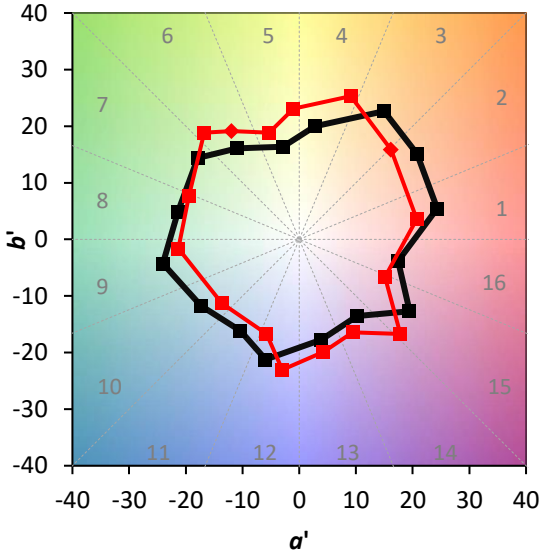
R_f = 70.6
R_g = 97.2
CIE R_a = 70.6
R_9 = -27.1

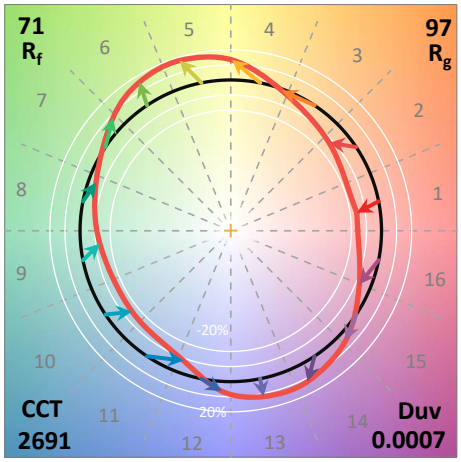
Spectral Power Distribution Comparison

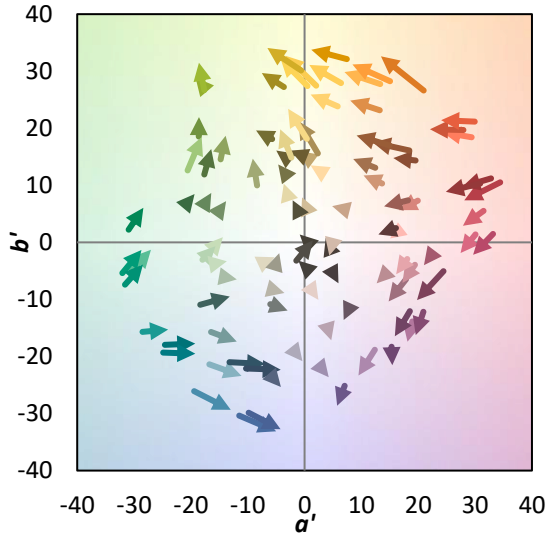


Color Vector Graphics









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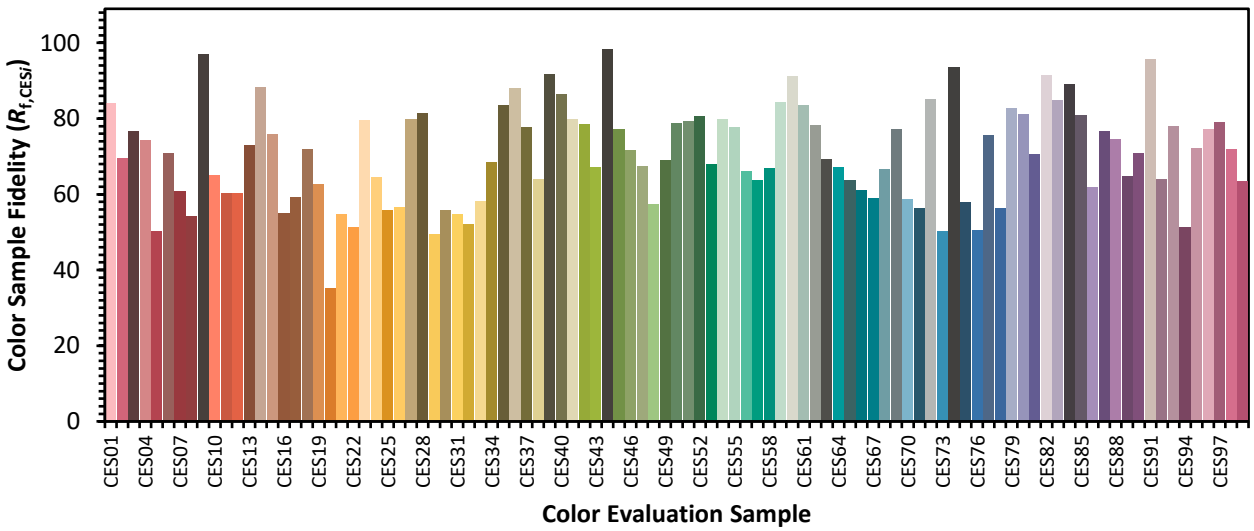
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 57	CES51 = 79	CES76 = 50
CES02 = 63	CES27 = 80	CES52 = 81	CES77 = 76
CES03 = 31	CES28 = 81	CES53 = 68	CES78 = 56
CES04 = 71	CES29 = 49	CES54 = 80	CES79 = 83
CES05 = 50	CES30 = 56	CES55 = 78	CES80 = 81
CES06 = 52	CES31 = 55	CES56 = 66	CES81 = 71
CES07 = 42	CES32 = 52	CES57 = 64	CES82 = 92
CES08 = 41	CES33 = 58	CES58 = 67	CES83 = 85
CES09 = 29	CES34 = 69	CES59 = 84	CES84 = 89
CES10 = 77	CES35 = 84	CES60 = 91	CES85 = 81
CES11 = 60	CES36 = 88	CES61 = 84	CES86 = 62
CES12 = 66	CES37 = 78	CES62 = 78	CES87 = 77
CES13 = 44	CES38 = 64	CES63 = 69	CES88 = 75
CES14 = 74	CES39 = 92	CES64 = 67	CES89 = 65
CES15 = 72	CES40 = 86	CES65 = 64	CES90 = 71
CES16 = 48	CES41 = 80	CES66 = 61	CES91 = 96
CES17 = 51	CES42 = 79	CES67 = 59	CES92 = 64
CES18 = 57	CES43 = 67	CES68 = 67	CES93 = 78
CES19 = 73	CES44 = 98	CES69 = 77	CES94 = 51
CES20 = 67	CES45 = 77	CES70 = 59	CES95 = 72
CES21 = 88	CES46 = 72	CES71 = 56	CES96 = 77
CES22 = 80	CES47 = 67	CES72 = 85	CES97 = 79
CES23 = 92	CES48 = 57	CES73 = 50	CES98 = 72
CES24 = 92	CES49 = 69	CES74 = 94	CES99 = 63
CES25 = 73	CES50 = 79	CES75 = 58	



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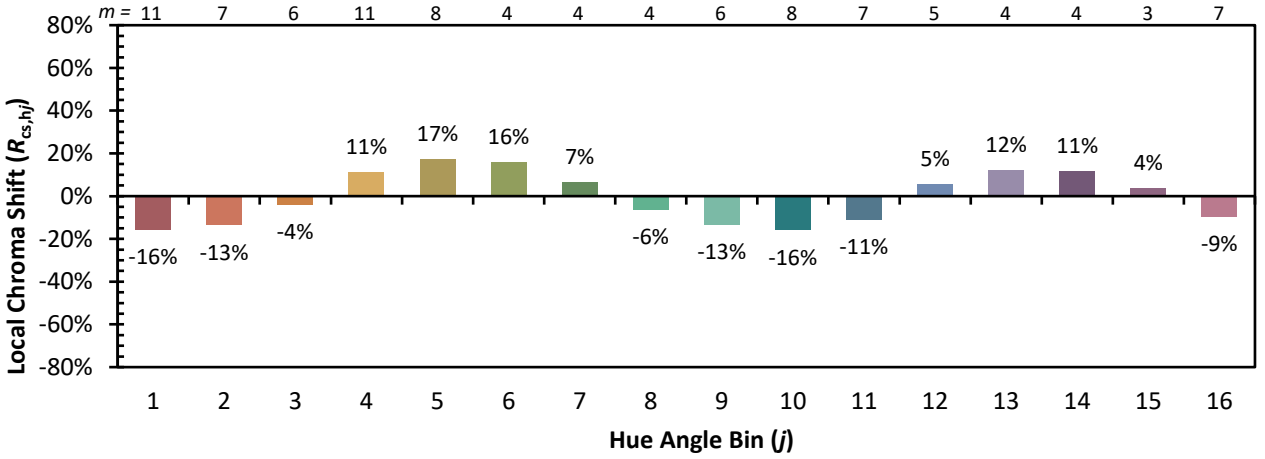
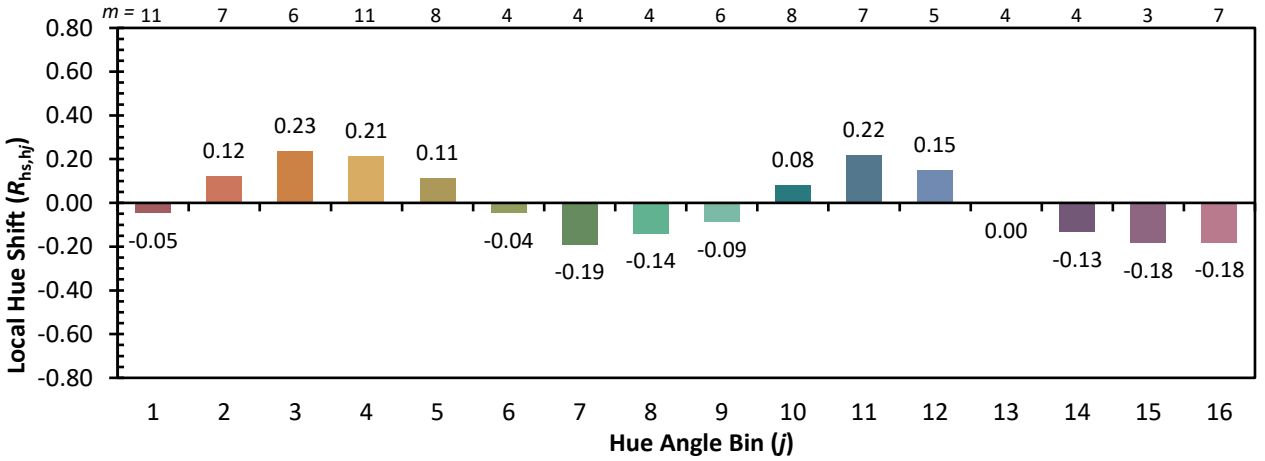
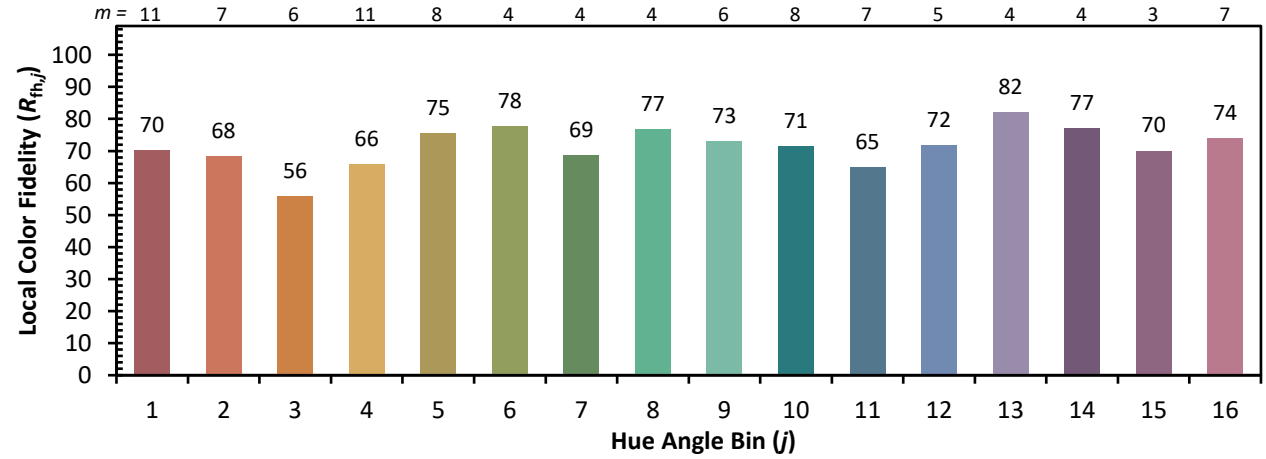
Color Rendition by Hue-Angle Bin







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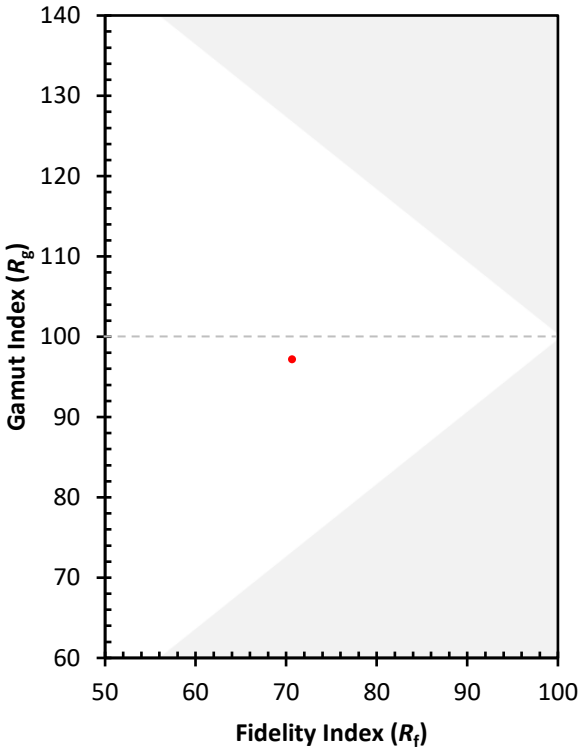
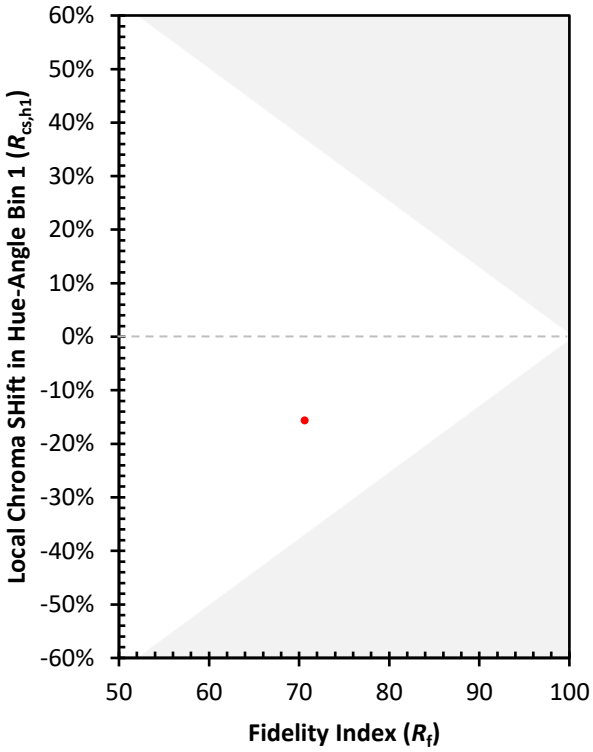
Measure Comparisons





(END OF REPORT)