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: P880460

Luminaire Tested: **EMM2-HTN-VA1-830-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:	P880460
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	10/01/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HTN-VA1-830-U-CQ
Description:	EPIC MODERN TALL HOUSING 1W 80CRI 3000K VISUAL COMFORT FIXTURE w/ TYPE V CONCENTRATED DISTRIBUTION OPTIC
Light Source:	(1) 3000K CCT, 80 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	2124.1 lumens
Efficiency:	N/A
Efficacy:	75.9 lumens/watt
Luminous Opening:	Circular (Dia: 1.12' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B1 - U0 - G1

Input Watts (W):	28
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.99
Total Harmonic Distortion (THDi):	16%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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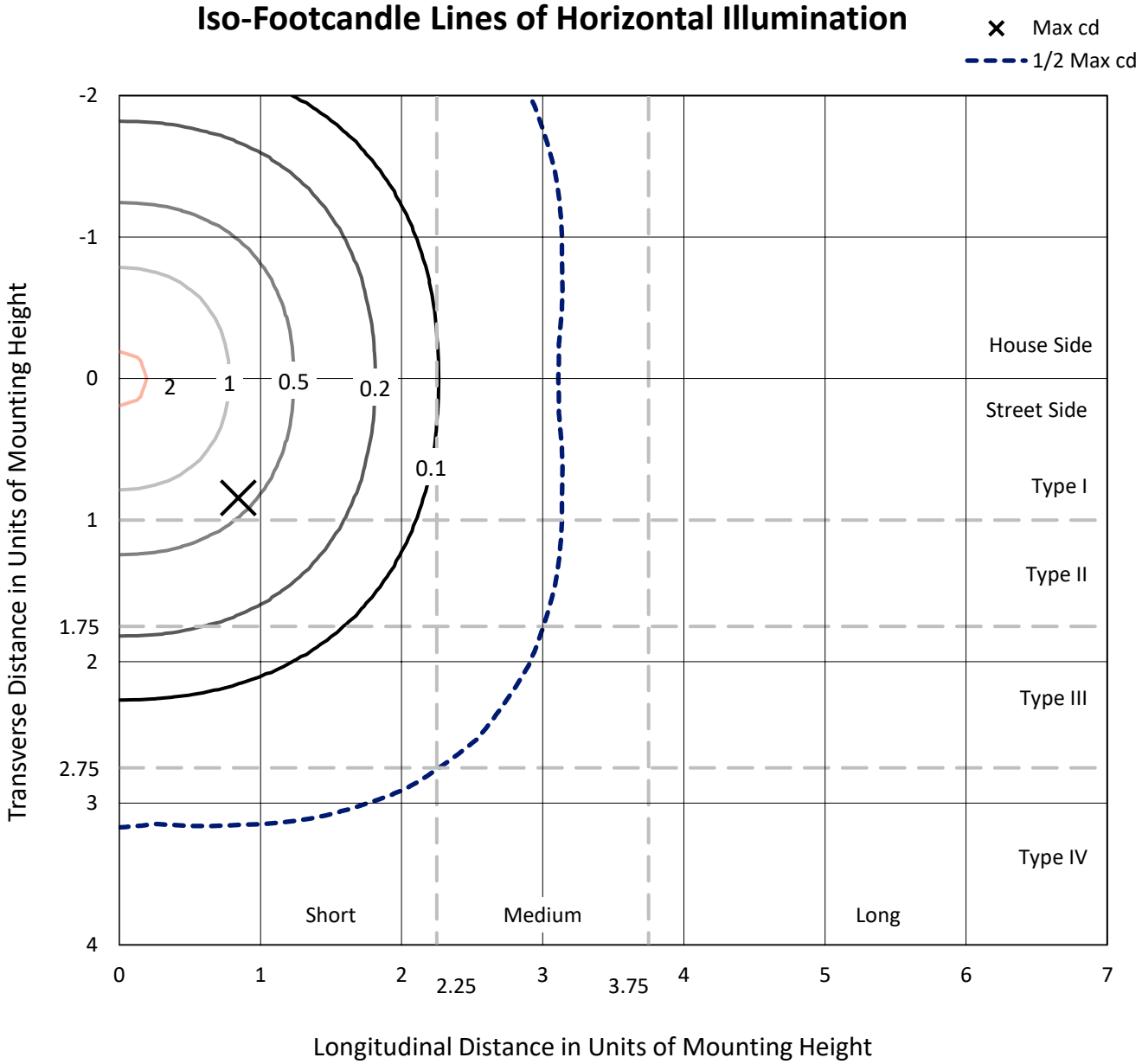
Scaled Data Report

REPORT NUMBER: P880460
CATALOG NUMBER: EMM2-HTN-VA1-830-U-CQ

Iso-Footcandle Lines of Horizontal Illumination



Based on 15 foot mounting height. Maximum calculated value = 2.1 fc
Type V - Short - N/A

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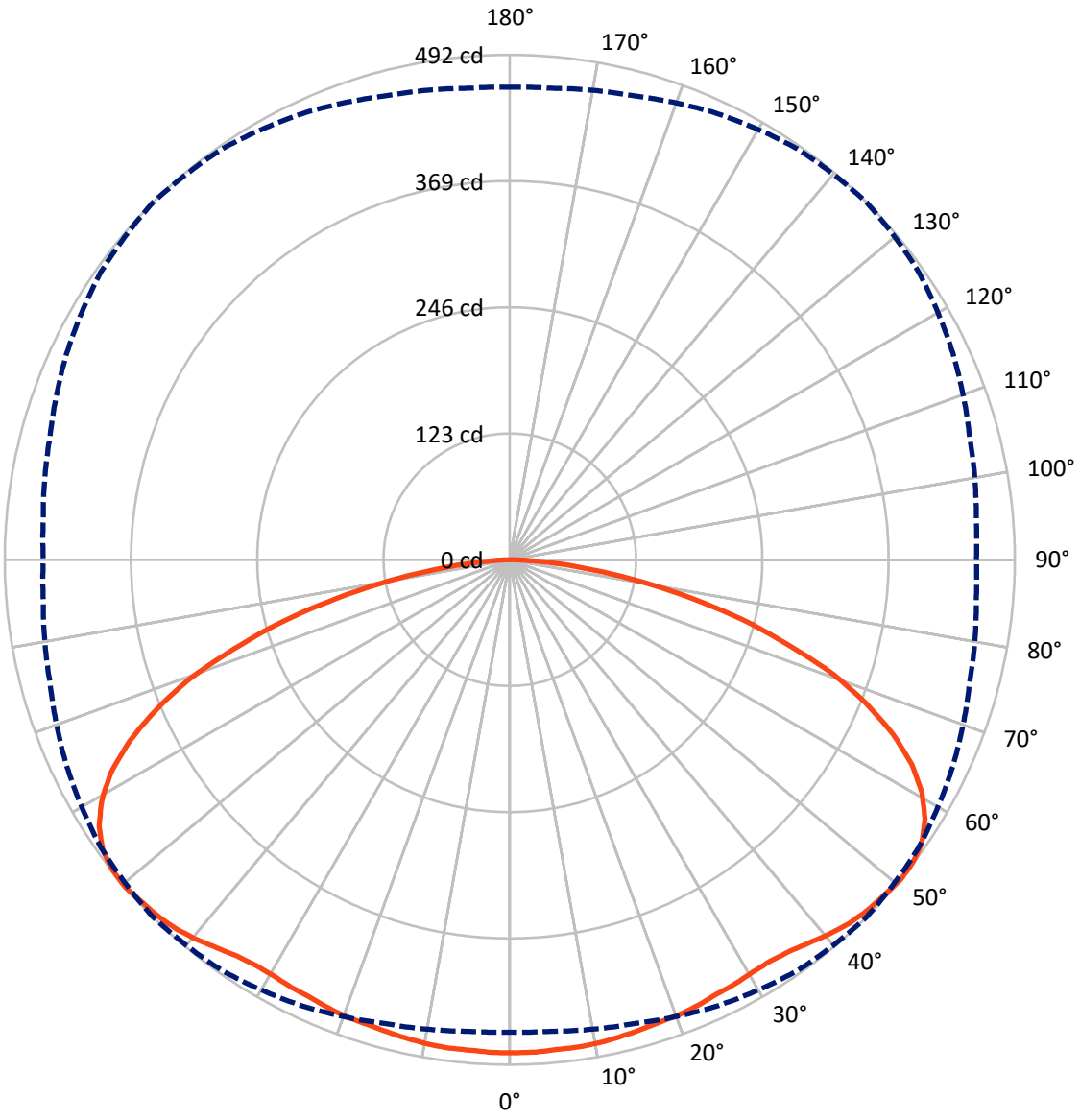
Luminous Intensity Polar Plot



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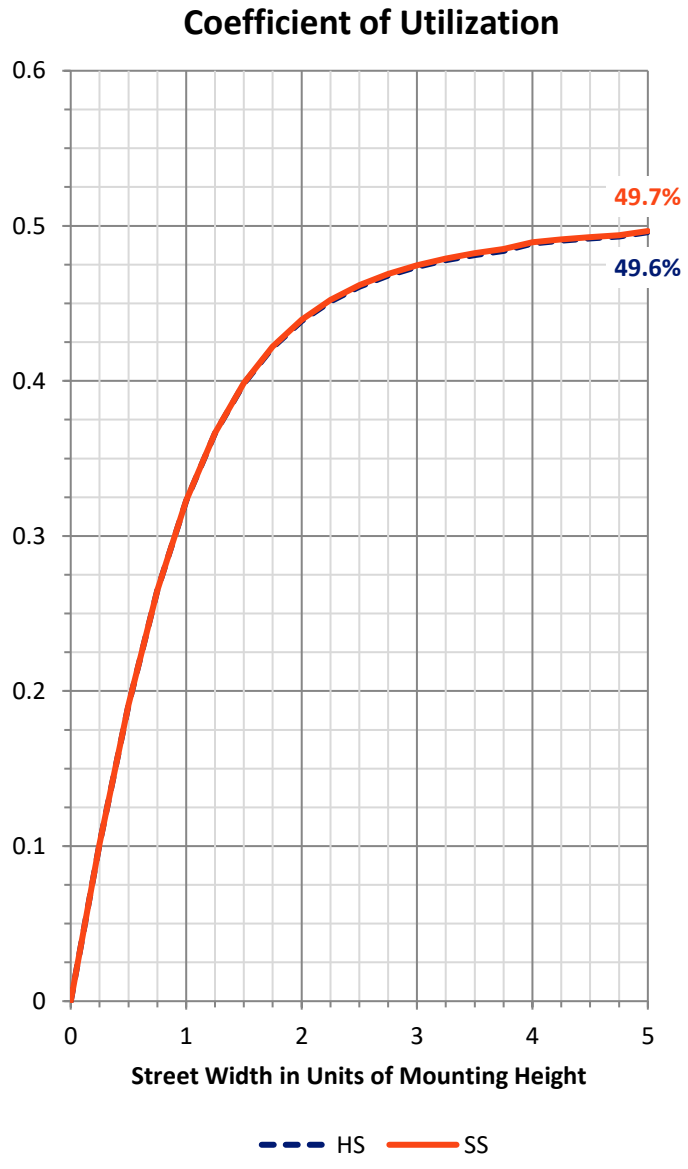
REPORT NUMBER: P880460
CATALOG NUMBER: EMM2-HTN-VA1-830-U-CQ

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	1062.0	0.0	1062.0
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	1062.0	0.0	1062.0
	% Fixture	50.0	0.0	50.0
Total	Lumens	2124.1	0.0	2124.1
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	45.8	2.2
10°-20°	134.6	6.3
20°-30°	216.5	10.2
30°-40°	292.3	13.8
40°-50°	367.4	17.3
50°-60°	413.0	19.4
60°-70°	376.1	17.7
70°-80°	227.1	10.7
80°-90°	51.2	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°	2124.1	100.0
0°-180°	2124.1	100.0



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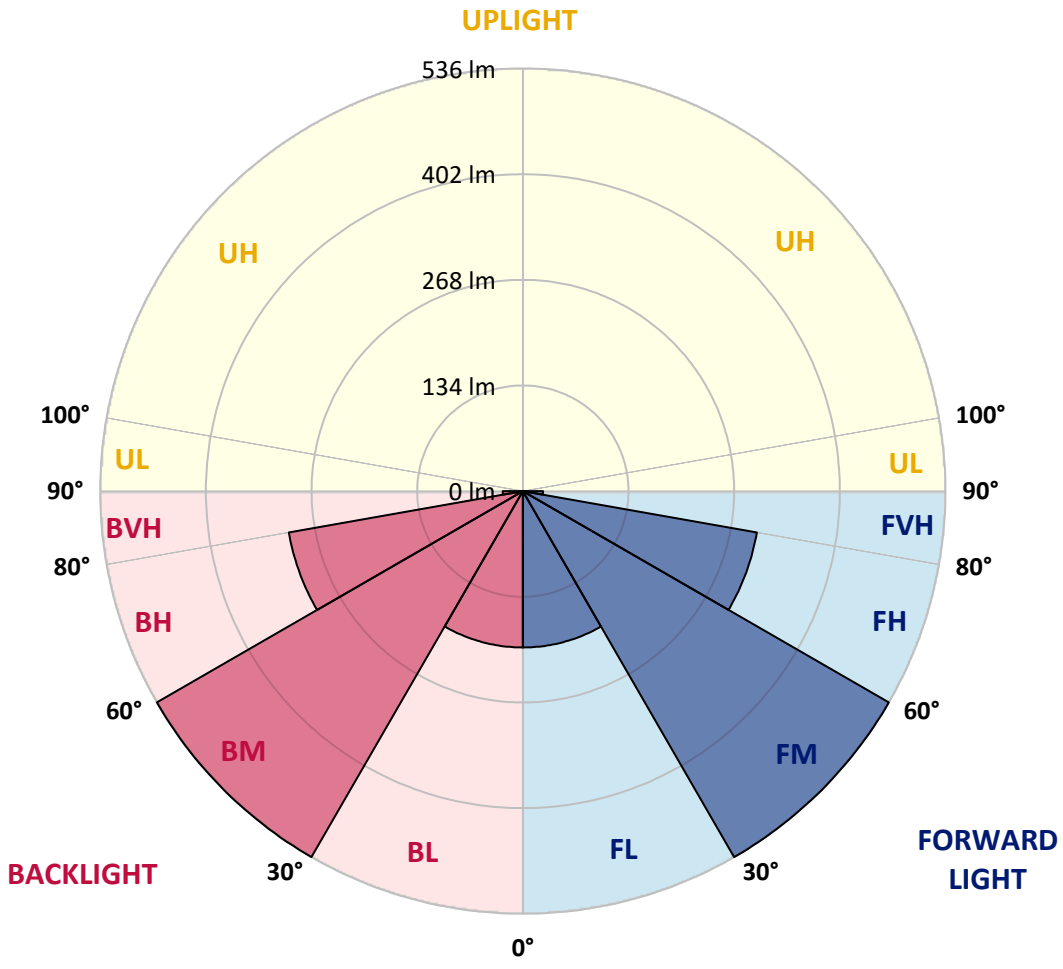
REPORT NUMBER: P880460
CATALOG NUMBER: EMM2-HTN-VA1-830-U-CQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	198.4	9.3			
FM	(30°-60°)	536.4	25.3			
FH	(60°-80°)	301.6	14.2			G0/660
FVH	(80°-90°)	25.6	1.2			G1/100
BL	(0°-30°)	198.4	9.3	B1/500		
BM	(30°-60°)	536.4	25.3	B1/1000		
BH	(60°-80°)	301.6	14.2	B1/500		G0/660
BVH	(80°-90°)	25.6	1.2			G1/100
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B1-U0-G1
Type V Short



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Scaled Data Report

REPORT NUMBER: P880460
CATALOG NUMBER: EMM2-HTN-VA1-830-U-CQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	480.3	480.3	480.3	480.3	480.3	*480.3*	480.3	480.3	480.3	480.3	480.3
2.5°	480.3	480.3	480.3	480.3	480.3	*480.3*	480.3	480.3	480.3	480.3	480.3
5°	479.4	479.4	479.4	479.4	479.4	*479.4*	479.4	479.4	479.4	479.4	480.3
7.5°	478.6	479.4	479.4	478.6	479.4	*479.4*	479.4	479.4	479.4	479.4	479.4
10°	477.8	477.8	478.6	478.6	478.6	*478.6*	478.6	478.6	478.6	478.6	477.8
12.5°	476.1	476.9	476.9	476.9	476.9	*476.9*	476.9	476.9	476.9	476.9	476.9
15°	475.3	475.3	475.3	475.3	475.3	*475.3*	475.3	475.3	474.4	474.4	475.3
17.5°	472.8	472.8	473.6	473.6	473.6	*473.6*	473.6	473.6	472.8	472.8	472.8
20°	471.1	471.1	471.9	471.9	471.9	*472.8*	471.9	471.1	471.1	471.1	471.1
22.5°	469.4	469.4	470.3	470.3	471.1	*471.1*	470.3	470.3	469.4	469.4	469.4
25°	467.8	467.8	467.8	468.6	469.4	*468.6*	468.6	467.8	466.9	466.1	466.1
27.5°	465.3	465.3	465.3	466.9	466.9	*467.8*	466.9	466.1	464.4	463.6	463.6
30°	462.8	462.8	463.6	465.3	466.1	*466.1*	465.3	463.6	461.9	461.1	461.1
32.5°	460.3	461.1	461.9	464.4	465.3	*466.1*	464.4	462.8	460.3	458.6	458.6
35°	460.3	460.3	462.8	465.3	467.8	*468.6*	466.9	463.6	460.3	457.8	457.8
37.5°	461.1	461.9	465.3	468.6	471.9	*473.6*	471.1	466.9	461.9	458.6	458.6
40°	464.4	464.4	468.6	474.4	478.6	*479.4*	476.9	471.1	464.4	460.3	459.4
42.5°	466.1	466.9	471.1	477.8	482.8	*484.4*	481.1	474.4	466.1	460.3	459.4
45°	466.1	466.9	471.9	479.4	486.1	*487.8*	484.4	476.1	466.9	461.1	459.4
47.5°	463.6	464.4	471.1	480.3	487.8	*489.4*	485.3	476.9	466.1	459.4	457.8
50°	*460.3*	*461.1*	*467.8*	*479.4*	*488.6*	*491.9*	*486.9*	*476.1*	*463.6*	*456.1*	*454.4*
52.5°	453.6	454.4	463.6	476.1	487.8	*491.1*	485.3	473.6	458.6	450.3	448.6
55°	443.6	445.2	454.4	469.4	482.8	*486.9*	480.3	466.9	451.1	441.1	439.4
57.5°	430.2	431.1	441.9	458.6	472.8	*476.9*	470.3	456.1	438.6	427.7	426.9
60°	411.1	412.7	425.2	441.9	456.9	*461.1*	454.4	439.4	421.1	409.4	408.6
62.5°	387.7	389.4	401.1	420.2	435.2	*439.4*	432.7	416.9	398.6	386.0	385.2
65°	358.5	360.2	371.9	390.2	406.1	*410.2*	404.4	387.7	369.4	357.7	356.0
67.5°	326.0	327.7	338.5	354.4	368.5	*374.4*	368.5	354.4	336.9	322.7	321.0
70°	286.8	286.8	297.7	313.5	326.8	*334.4*	326.8	312.7	295.2	283.5	283.5
72.5°	246.0	244.3	254.3	269.3	280.2	*283.5*	281.8	269.3	252.6	241.8	240.1
75°	196.8	200.1	207.6	218.5	230.1	*235.1*	229.3	218.5	206.8	197.6	196.8
77.5°	152.6	155.1	161.8	170.9	177.6	*180.9*	179.3	170.9	158.4	154.3	152.6
80°	107.6	109.2	115.1	121.7	126.7	*130.1*	127.6	120.9	114.2	110.1	108.4
82.5°	70.0	69.2	74.2	78.4	82.5	*81.7*	80.9	75.9	73.4	70.0	69.2
85°	35.9	36.7	36.7	40.9	41.7	*43.4*	42.5	40.9	36.7	35.0	35.9
87.5°	11.7	11.7	12.5	12.5	14.2	*14.2*	15.0	13.3	12.5	10.8	10.8
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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LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-7

Test Date: 09/27/2024

Luminaire Tested: MEM2-HTN-VA-30-830-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-830-U-WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

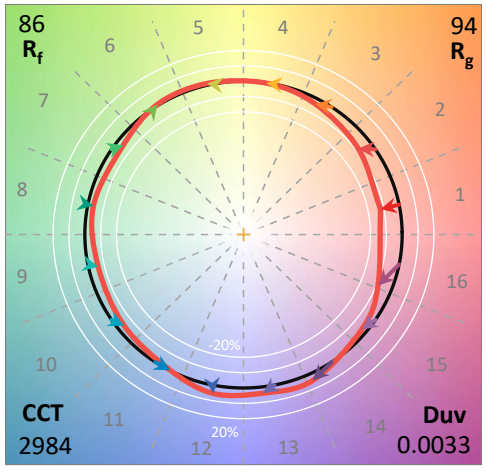
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-176-7
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-30-830-U-WQ**
Description:	EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE

Spectral Parameters

CCT (K):	2984
CIE u':	0.2500
CIE v':	0.5264
Duv:	0.0033
CIE x:	0.4431
CIE y:	0.4147
CIE z:	0.1422
Peak Wavelength (nm):	601
Dominant Wavelength (nm):	581
Purity:	57.4798
Rf:	85.8
Rg:	94.1

CRI (Ra):	81.8
R1:	79.4
R2:	89.9
R3:	96.6
R4:	80.6
R5:	80.1
R6:	88.9
R7:	82.6
R8:	56.0
R9:	-1.1
R10:	78.4
R11:	80.8
R12:	72.8
R13:	81.7
R14:	98.5
R15:	70.2



Test Conditions

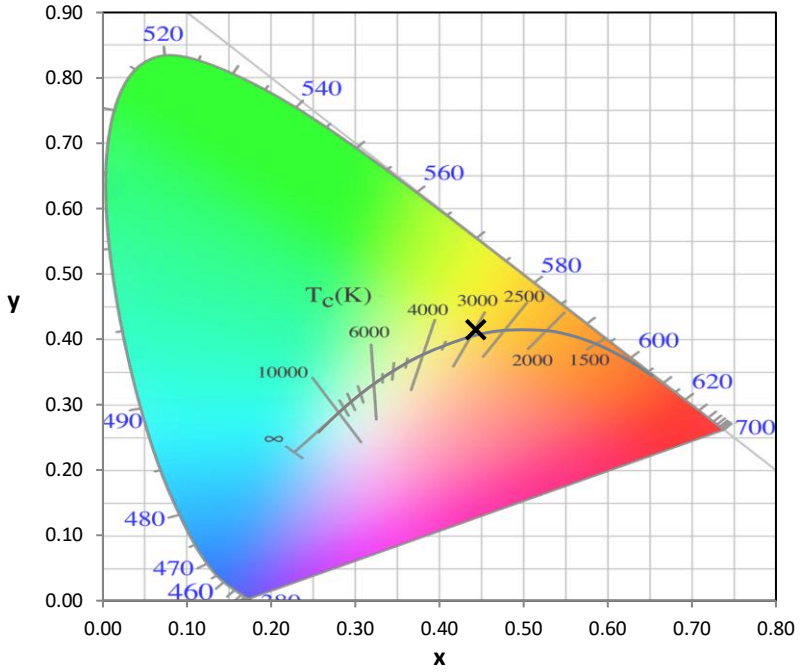
Stabilization Time:	29M
Operation Time:	1H 29M
Sphere Temperature (°C):	25.2

REPORT NUMBER: SP1-2407-176-7

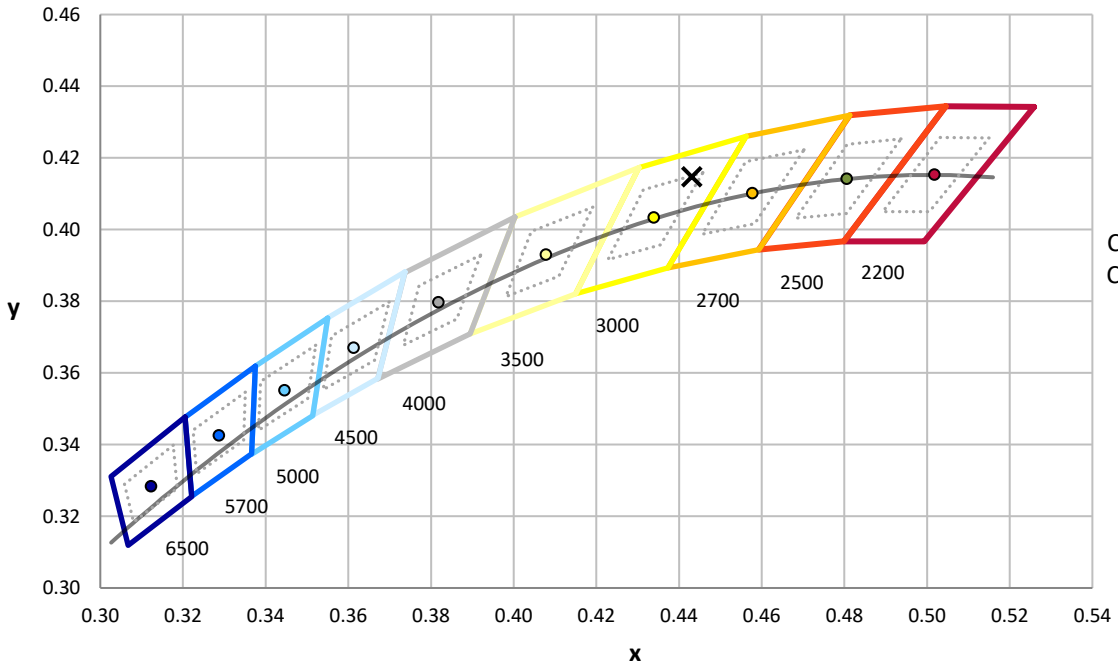
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085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

REPORT NUMBER: SP1-2407-176-7

CIE 1931 Chromaticity Diagram



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



CCT = 2984K
CIE x = 0.4431
CIE y = 0.4147
Duv = 0.0033

Point lies inside the ANSI 3000K 4-step quadrangle

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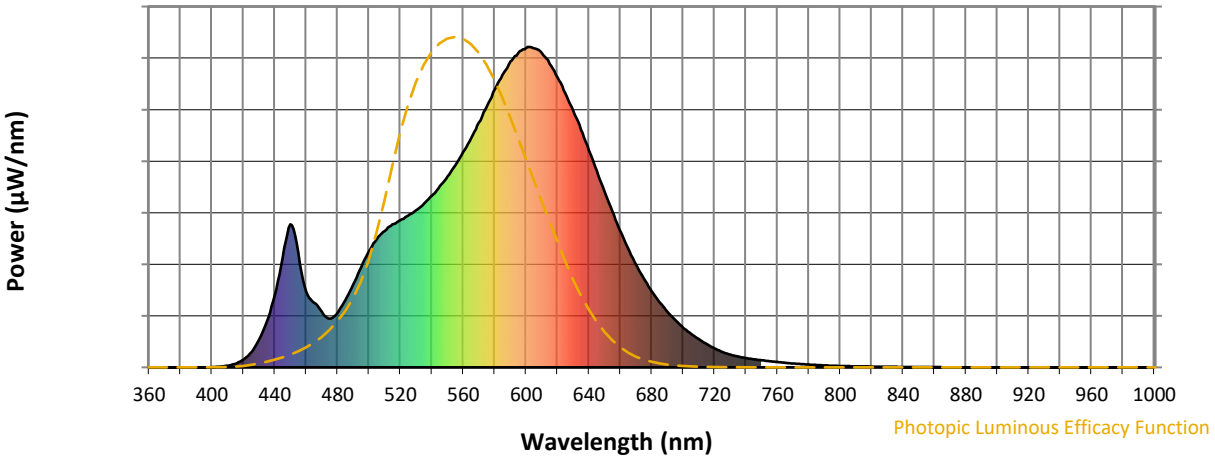
Photopic Flux vs. Wavelength

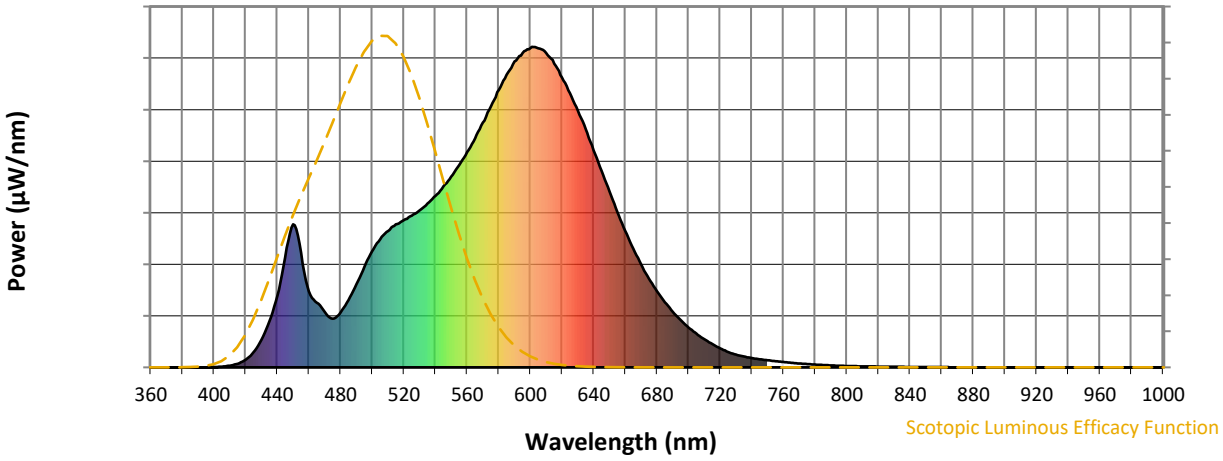


Photopic Lumens: NR

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	260	NR	620	905	NR	750	22	NR	880	0	NR
365	0	NR	495	312	NR	625	856	NR	755	19	NR	885	0	NR
370	0	NR	500	362	NR	630	801	NR	760	17	NR	890	0	NR
375	0	NR	505	399	NR	635	742	NR	765	14	NR	895	0	NR
380	0	NR	510	425	NR	640	677	NR	770	12	NR	900	0	NR
385	0	NR	515	446	NR	645	613	NR	775	10	NR	905	0	NR
390	0	NR	520	459	NR	650	549	NR	780	9	NR	910	0	NR
395	0	NR	525	473	NR	655	485	NR	785	7	NR	915	0	NR
400	1	NR	530	490	NR	660	425	NR	790	6	NR	920	0	NR
405	2	NR	535	511	NR	665	371	NR	795	5	NR	925	0	NR
410	5	NR	540	535	NR	670	321	NR	800	4	NR	930	0	NR
415	11	NR	545	565	NR	675	276	NR	805	4	NR	935	0	NR
420	24	NR	550	595	NR	680	238	NR	810	3	NR	940	0	NR
425	47	NR	555	631	NR	685	203	NR	815	3	NR	945	0	NR
430	86	NR	560	672	NR	690	174	NR	820	2	NR	950	0	NR
435	144	NR	565	715	NR	695	148	NR	825	2	NR	955	0	NR
440	224	NR	570	763	NR	700	124	NR	830	2	NR	960	0	NR
445	342	NR	575	814	NR	705	105	NR	835	2	NR	965	0	NR
450	446	NR	580	866	NR	710	88	NR	840	1	NR	970	0	NR
455	357	NR	585	912	NR	715	73	NR	845	1	NR	975	0	NR
460	237	NR	590	954	NR	720	59	NR	850	1	NR	980	0	NR
465	202	NR	595	981	NR	725	48	NR	855	1	NR	985	0	NR
470	172	NR	600	996	NR	730	40	NR	860	1	NR	990	0	NR
475	152	NR	605	996	NR	735	34	NR	865	1	NR	995	0	NR
480	171	NR	610	980	NR	740	29	NR	870	0	NR	1000	0	NR
485	210	NR	615	947	NR	745	25	NR	875	0	NR			

REPORT NUMBER: SP1-2407-176-7

Scotopic Flux vs. Wavelength

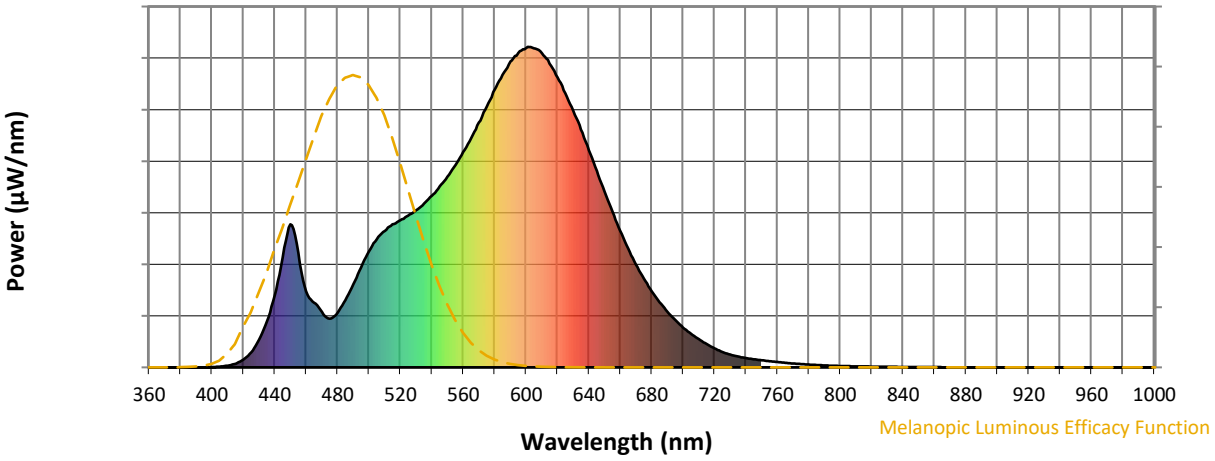


Scotopic Lumens: NR **S/P: 1.32**

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	260	NR	620	905	NR	750	22	NR	880	0	NR
365	0	NR	495	312	NR	625	856	NR	755	19	NR	885	0	NR
370	0	NR	500	362	NR	630	801	NR	760	17	NR	890	0	NR
375	0	NR	505	399	NR	635	742	NR	765	14	NR	895	0	NR
380	0	NR	510	425	NR	640	677	NR	770	12	NR	900	0	NR
385	0	NR	515	446	NR	645	613	NR	775	10	NR	905	0	NR
390	0	NR	520	459	NR	650	549	NR	780	9	NR	910	0	NR
395	0	NR	525	473	NR	655	485	NR	785	7	NR	915	0	NR
400	1	NR	530	490	NR	660	425	NR	790	6	NR	920	0	NR
405	2	NR	535	511	NR	665	371	NR	795	5	NR	925	0	NR
410	5	NR	540	535	NR	670	321	NR	800	4	NR	930	0	NR
415	11	NR	545	565	NR	675	276	NR	805	4	NR	935	0	NR
420	24	NR	550	595	NR	680	238	NR	810	3	NR	940	0	NR
425	47	NR	555	631	NR	685	203	NR	815	3	NR	945	0	NR
430	86	NR	560	672	NR	690	174	NR	820	2	NR	950	0	NR
435	144	NR	565	715	NR	695	148	NR	825	2	NR	955	0	NR
440	224	NR	570	763	NR	700	124	NR	830	2	NR	960	0	NR
445	342	NR	575	814	NR	705	105	NR	835	2	NR	965	0	NR
450	446	NR	580	866	NR	710	88	NR	840	1	NR	970	0	NR
455	357	NR	585	912	NR	715	73	NR	845	1	NR	975	0	NR
460	237	NR	590	954	NR	720	59	NR	850	1	NR	980	0	NR
465	202	NR	595	981	NR	725	48	NR	855	1	NR	985	0	NR
470	172	NR	600	996	NR	730	40	NR	860	1	NR	990	0	NR
475	152	NR	605	996	NR	735	34	NR	865	1	NR	995	0	NR
480	171	NR	610	980	NR	740	29	NR	870	0	NR	1000	0	NR
485	210	NR	615	947	NR	745	25	NR	875	0	NR			

REPORT NUMBER: SP1-2407-176-7

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 2.51**

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	260	NR	620	905	NR	750	22	NR	880	0	NR
365	0	NR	495	312	NR	625	856	NR	755	19	NR	885	0	NR
370	0	NR	500	362	NR	630	801	NR	760	17	NR	890	0	NR
375	0	NR	505	399	NR	635	742	NR	765	14	NR	895	0	NR
380	0	NR	510	425	NR	640	677	NR	770	12	NR	900	0	NR
385	0	NR	515	446	NR	645	613	NR	775	10	NR	905	0	NR
390	0	NR	520	459	NR	650	549	NR	780	9	NR	910	0	NR
395	0	NR	525	473	NR	655	485	NR	785	7	NR	915	0	NR
400	1	NR	530	490	NR	660	425	NR	790	6	NR	920	0	NR
405	2	NR	535	511	NR	665	371	NR	795	5	NR	925	0	NR
410	5	NR	540	535	NR	670	321	NR	800	4	NR	930	0	NR
415	11	NR	545	565	NR	675	276	NR	805	4	NR	935	0	NR
420	24	NR	550	595	NR	680	238	NR	810	3	NR	940	0	NR
425	47	NR	555	631	NR	685	203	NR	815	3	NR	945	0	NR
430	86	NR	560	672	NR	690	174	NR	820	2	NR	950	0	NR
435	144	NR	565	715	NR	695	148	NR	825	2	NR	955	0	NR
440	224	NR	570	763	NR	700	124	NR	830	2	NR	960	0	NR
445	342	NR	575	814	NR	705	105	NR	835	2	NR	965	0	NR
450	446	NR	580	866	NR	710	88	NR	840	1	NR	970	0	NR
455	357	NR	585	912	NR	715	73	NR	845	1	NR	975	0	NR
460	237	NR	590	954	NR	720	59	NR	850	1	NR	980	0	NR
465	202	NR	595	981	NR	725	48	NR	855	1	NR	985	0	NR
470	172	NR	600	996	NR	730	40	NR	860	1	NR	990	0	NR
475	152	NR	605	996	NR	735	34	NR	865	1	NR	995	0	NR
480	171	NR	610	980	NR	740	29	NR	870	0	NR	1000	0	NR
485	210	NR	615	947	NR	745	25	NR	875	0	NR			

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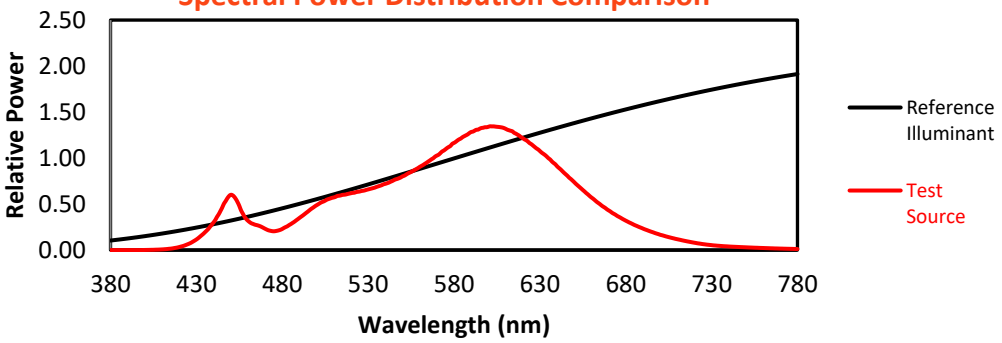
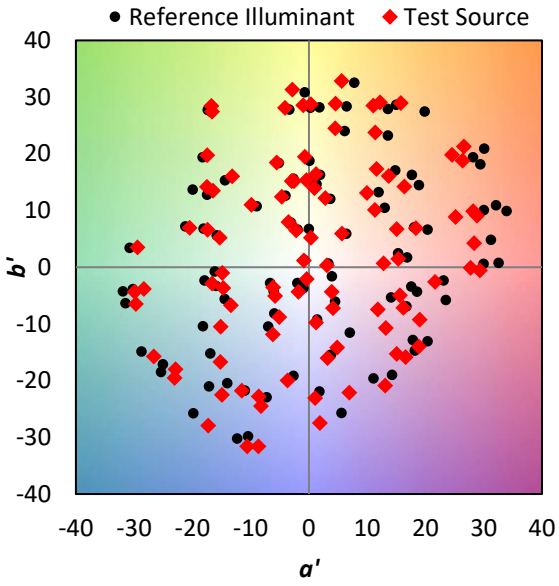
Summary

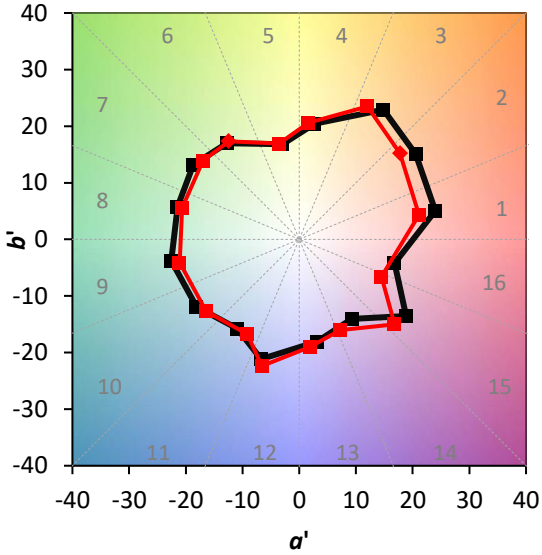
R_f = 85.8
R_g = 94.1
CIE R_a = 81.8
R_9 = -1.1

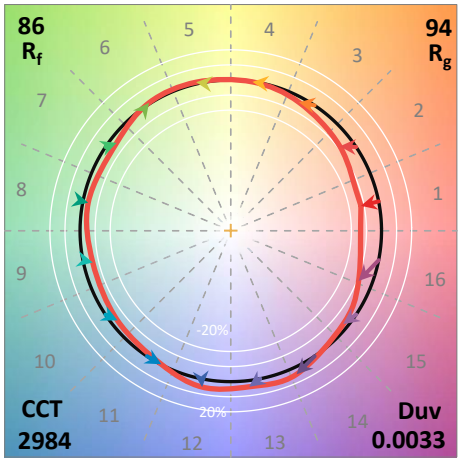
Spectral Power Distribution Comparison

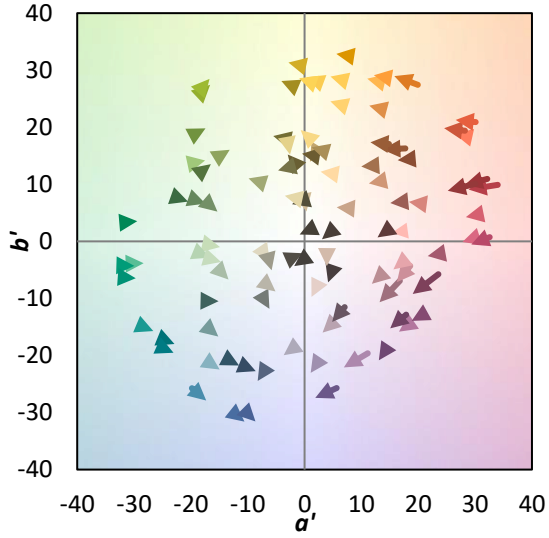


Color Vector Graphics









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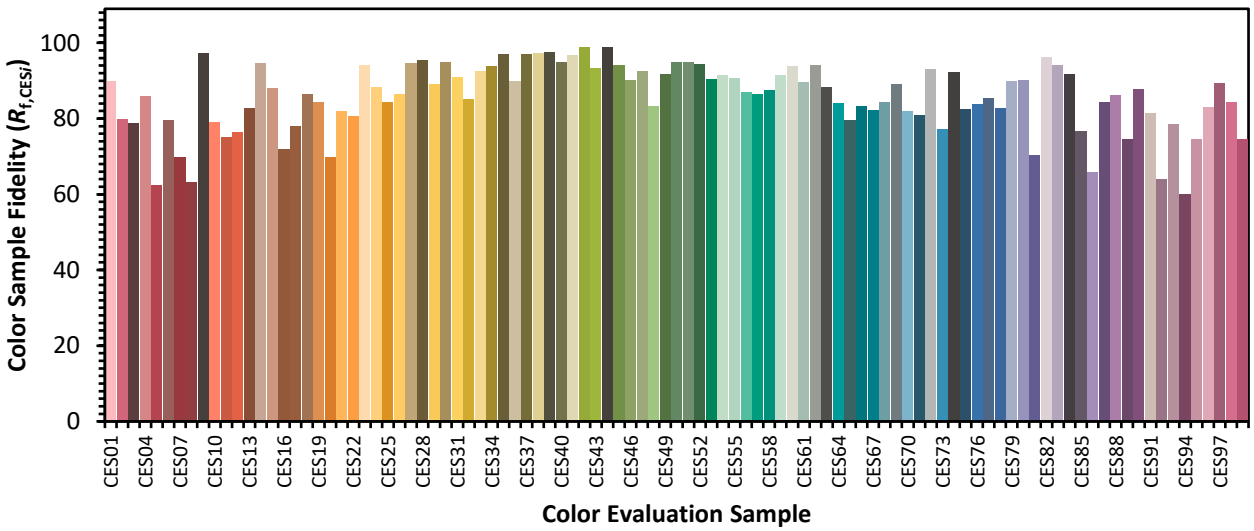
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 86	CES51 = 95	CES76 = 84
CES02 = 63	CES27 = 95	CES52 = 94	CES77 = 86
CES03 = 31	CES28 = 95	CES53 = 90	CES78 = 83
CES04 = 70	CES29 = 89	CES54 = 91	CES79 = 90
CES05 = 50	CES30 = 95	CES55 = 91	CES80 = 90
CES06 = 51	CES31 = 91	CES56 = 87	CES81 = 70
CES07 = 42	CES32 = 85	CES57 = 86	CES82 = 96
CES08 = 41	CES33 = 93	CES58 = 87	CES83 = 94
CES09 = 29	CES34 = 94	CES59 = 92	CES84 = 92
CES10 = 76	CES35 = 97	CES60 = 94	CES85 = 77
CES11 = 59	CES36 = 90	CES61 = 90	CES86 = 66
CES12 = 65	CES37 = 97	CES62 = 94	CES87 = 84
CES13 = 43	CES38 = 97	CES63 = 88	CES88 = 86
CES14 = 74	CES39 = 98	CES64 = 84	CES89 = 75
CES15 = 72	CES40 = 95	CES65 = 80	CES90 = 88
CES16 = 47	CES41 = 97	CES66 = 83	CES91 = 81
CES17 = 50	CES42 = 99	CES67 = 82	CES92 = 64
CES18 = 56	CES43 = 93	CES68 = 84	CES93 = 79
CES19 = 72	CES44 = 99	CES69 = 89	CES94 = 60
CES20 = 67	CES45 = 94	CES70 = 82	CES95 = 74
CES21 = 87	CES46 = 90	CES71 = 81	CES96 = 83
CES22 = 79	CES47 = 93	CES72 = 93	CES97 = 89
CES23 = 92	CES48 = 83	CES73 = 77	CES98 = 84
CES24 = 91	CES49 = 92	CES74 = 92	CES99 = 75
CES25 = 72	CES50 = 95	CES75 = 83	



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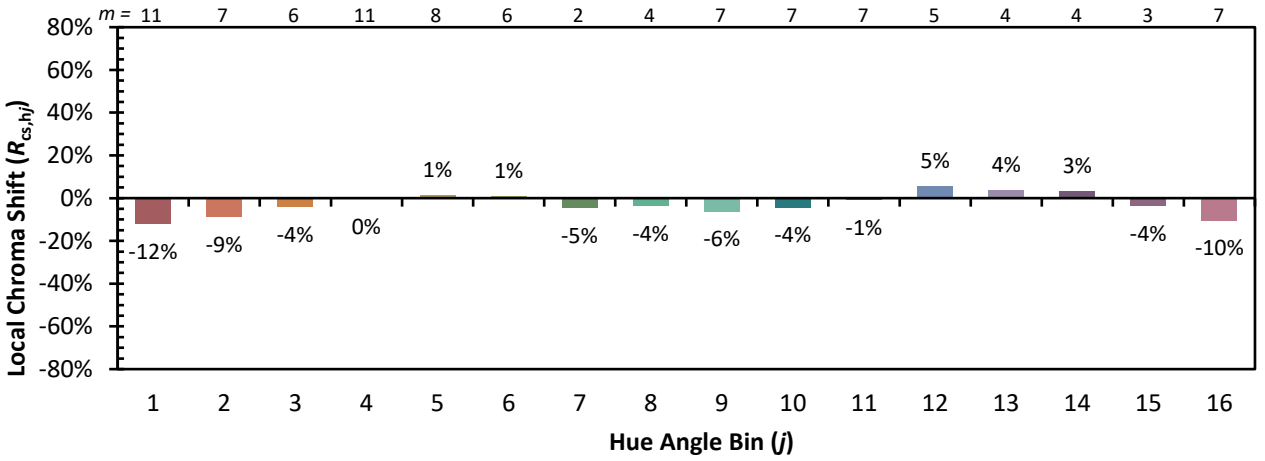
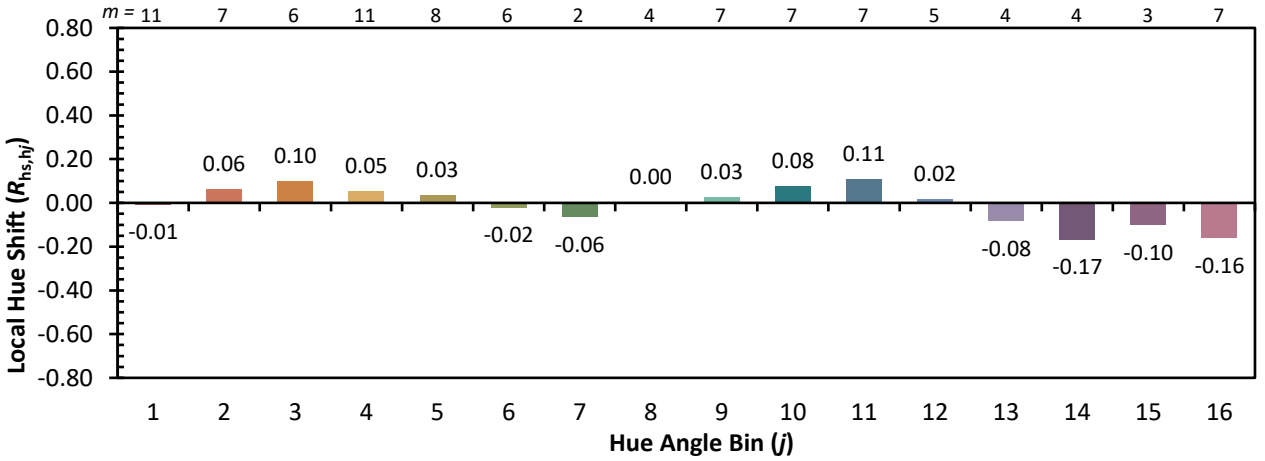
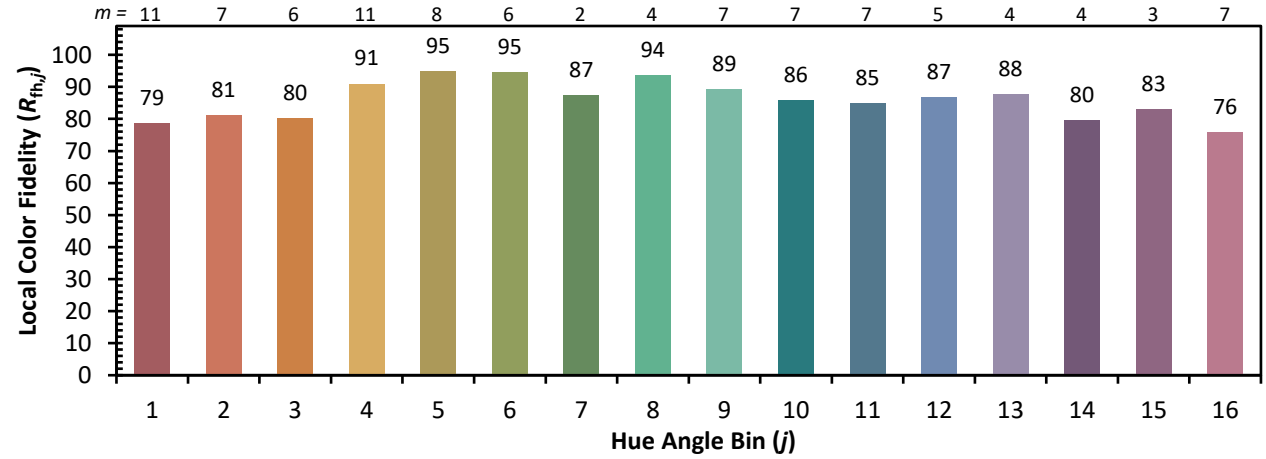
Color Rendition by Hue-Angle Bin







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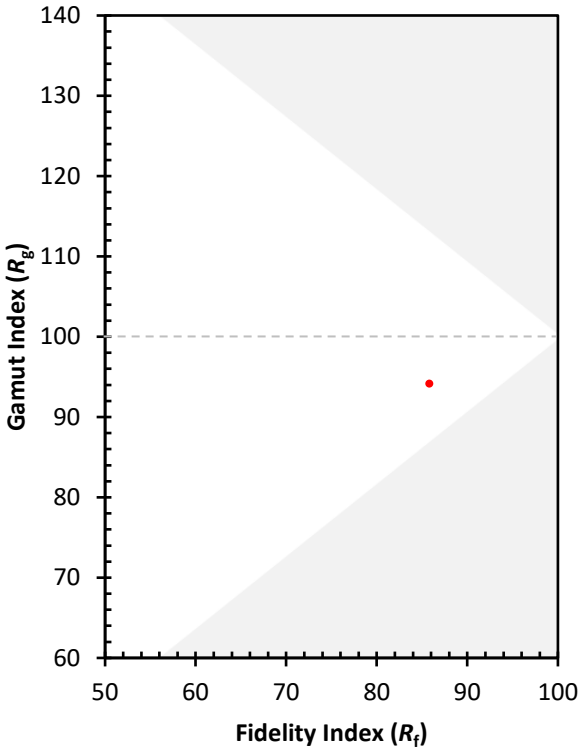
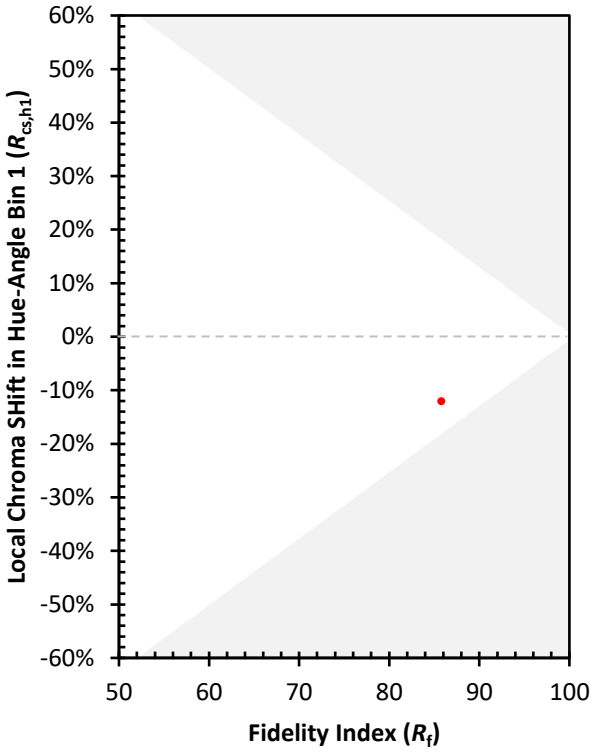
Measure Comparisons





(END OF REPORT)