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: P869129

Luminaire Tested: **EMM2-HSN-SA3A-730-U-T5M**

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:	P869129
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	08/22/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HSN-SA3A-730-U-T5M
Description:	EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 130W 70CRI 3000K FIXTURE w/ TYPE V SQUARE MEDIUM DISTRIBUTION OPTIC
Light Source:	(30) 3000K CCT, 70 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	16525.2 lumens
Efficiency:	N/A
Efficacy:	146.2 lumens/watt
Luminous Opening:	Rectangular (W 1' x L: 0.33' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B4 - U0 - G2

Input Watts (W):	113
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.99
Total Harmonic Distortion (THDi):	7.77%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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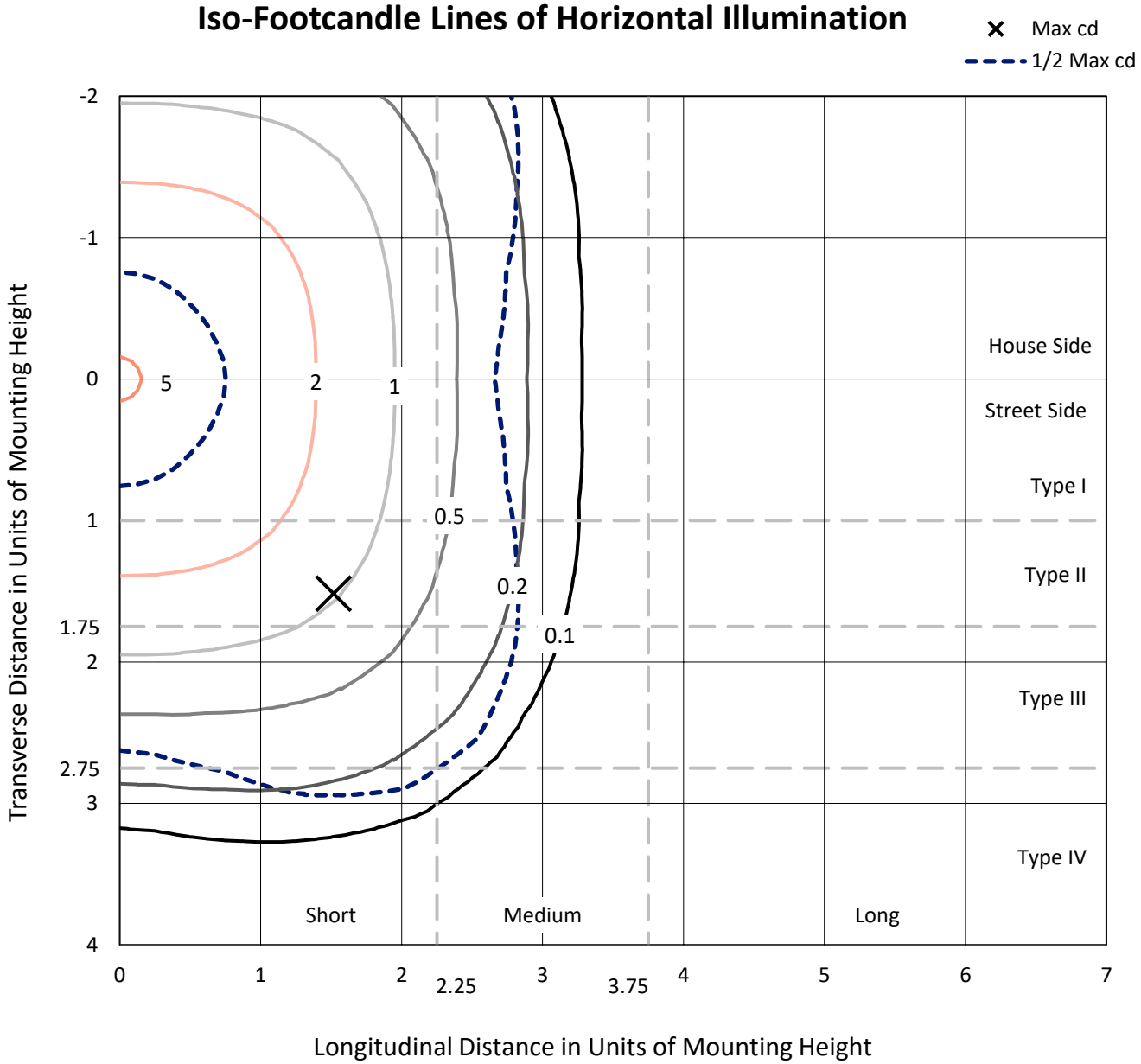
REPORT NUMBER: P869129
CATALOG NUMBER: EMM2-HSN-SA3A-730-U-T5M

Iso-Footcandle Lines of Horizontal Illumination



Based on 20 foot mounting height. Maximum calculated value = 5.1 fc
Type V - Short - N/A

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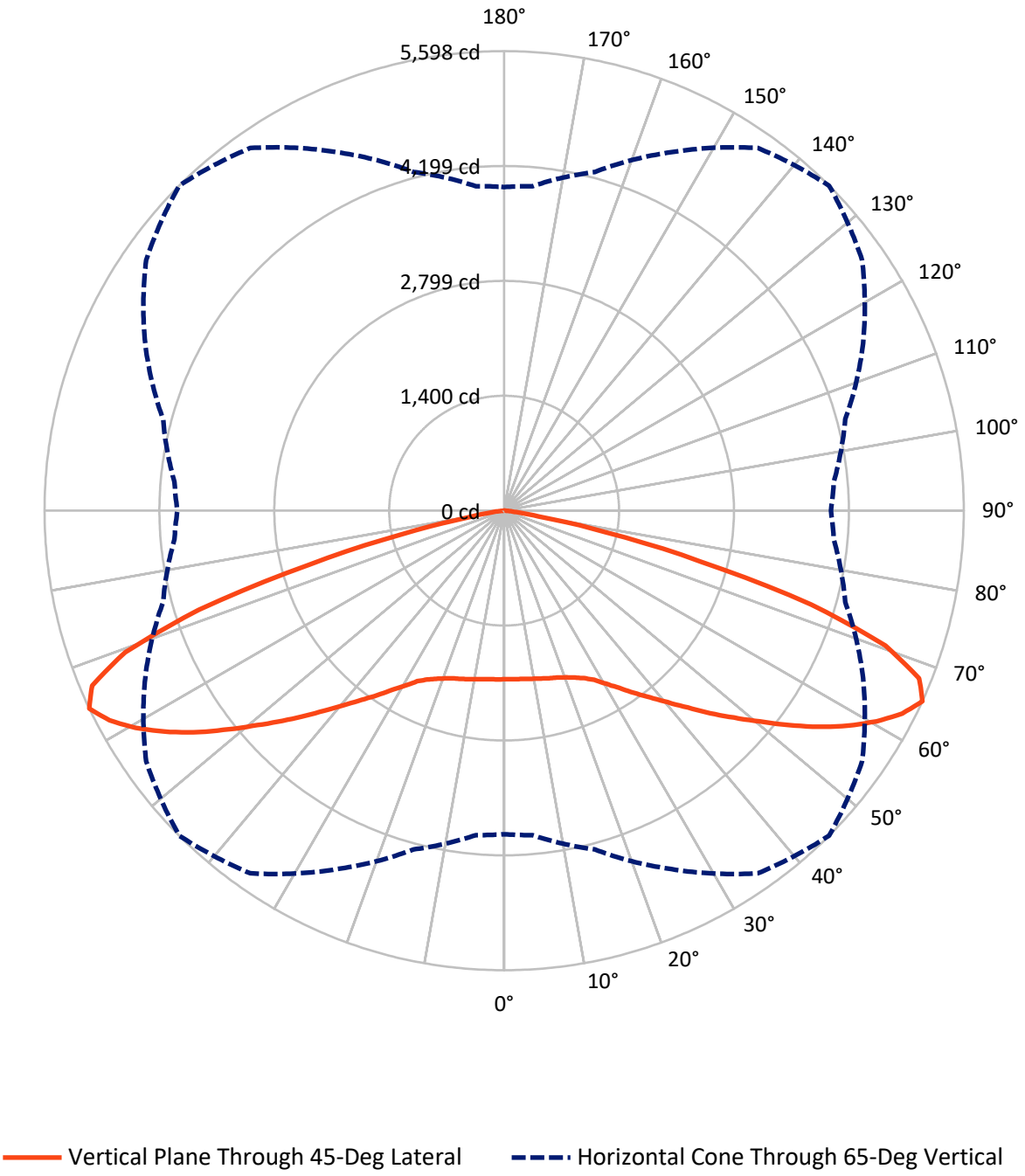
Luminous Intensity Polar Plot



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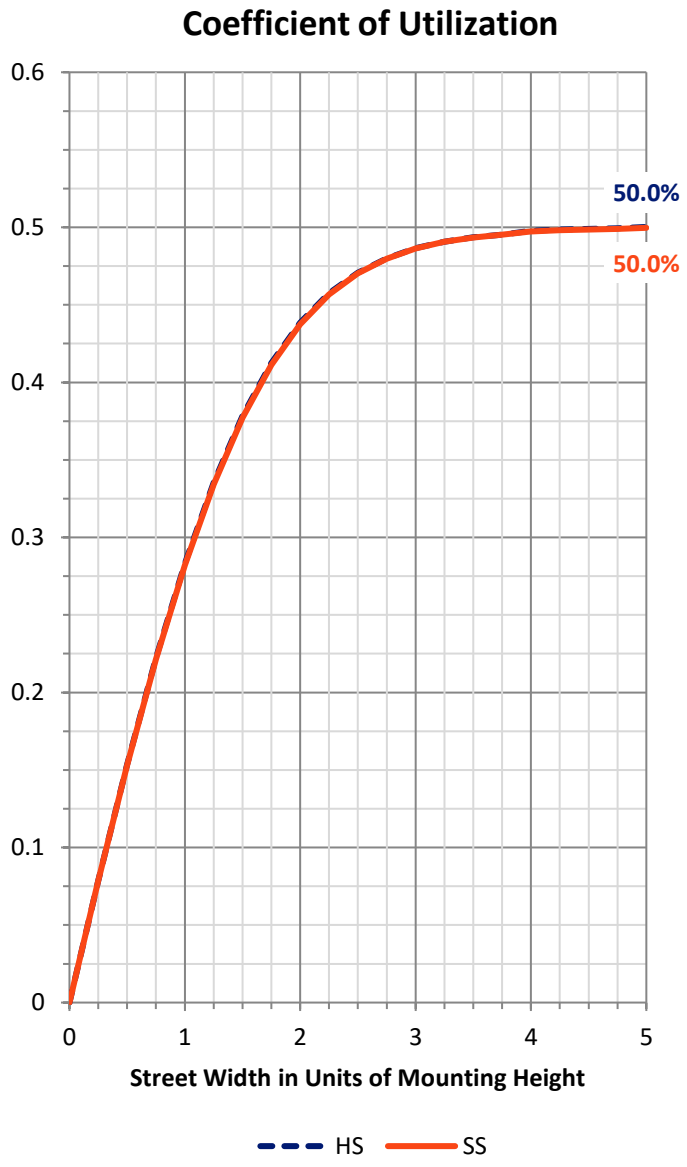
REPORT NUMBER: P869129
CATALOG NUMBER: EMM2-HSN-SA3A-730-U-T5M

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	8262.6	0.0	8262.6
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	8262.6	0.0	8262.6
	% Fixture	50.0	0.0	50.0
Total	Lumens	16525.2	0.0	16525.2
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	197.4	1.2
10°-20°	601.0	3.6
20°-30°	1057.1	6.4
30°-40°	1709.6	10.3
40°-50°	2663.0	16.1
50°-60°	3894.0	23.6
60°-70°	4484.1	27.1
70°-80°	1831.3	11.1
80°-90°	87.6	0.5
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°	16525.2	100.0
0°-180°	16525.2	100.0



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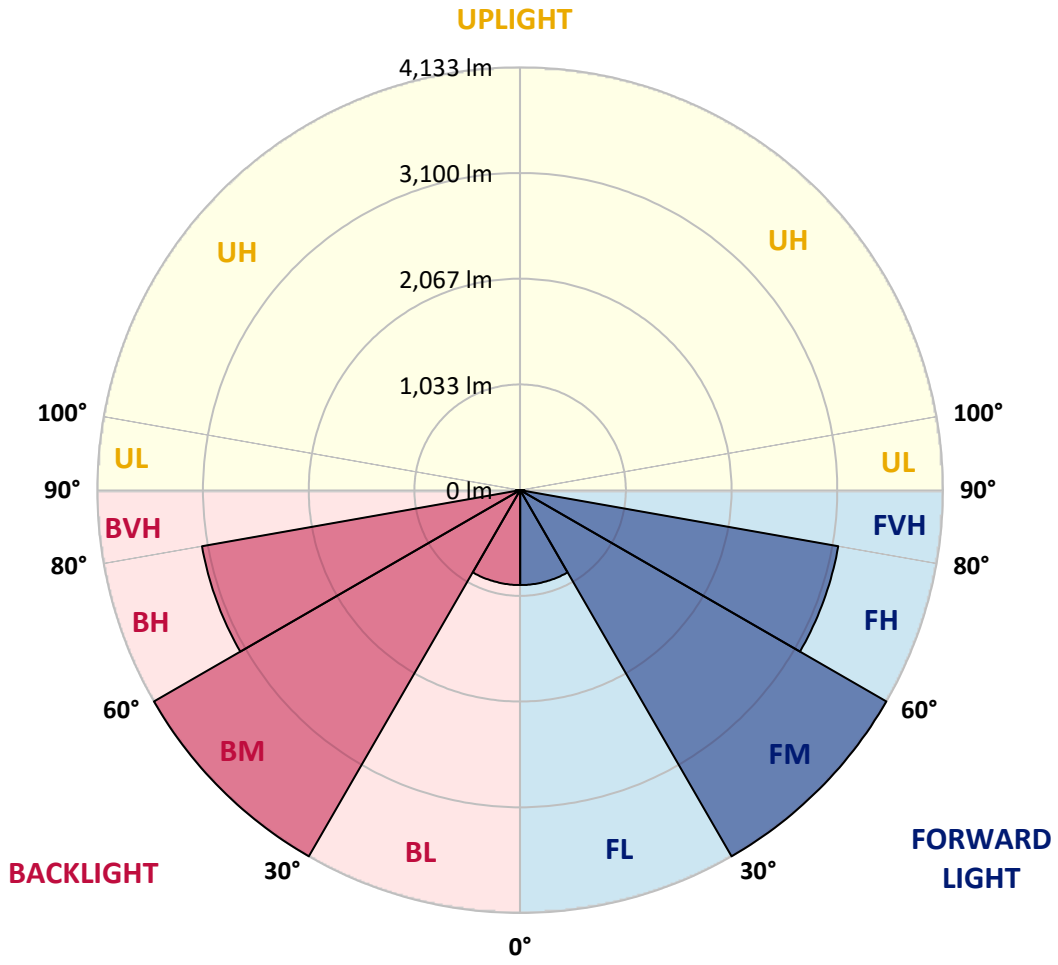
REPORT NUMBER: P869129
CATALOG NUMBER: EMM2-HSN-SA3A-730-U-T5M

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	927.8	5.6			
FM	(30°-60°)	4133.3	25.0			
FH	(60°-80°)	3157.7	19.1			G2/5000
FVH	(80°-90°)	43.8	0.3			G1/100
BL	(0°-30°)	927.8	5.6	B2/1000		
BM	(30°-60°)	4133.3	25.0	B3/5000		
BH	(60°-80°)	3157.7	19.1	B4/5000		G2/5000
BVH	(80°-90°)	43.8	0.3			G1/100
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B4-U0-G2
Type V Short



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REPORT NUMBER: P869129
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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	2053.3	2053.3	2053.3	2053.3	2053.3	2053.3	2053.3	2053.3	2053.3	2053.3	2053.3
2.5°	2059.7	2059.7	2056.5	2056.5	2050.2	2056.5	2053.3	2056.5	2053.3	2053.3	2056.5
5°	2066.0	2066.0	2059.7	2062.9	2056.5	2059.7	2056.5	2062.9	2059.7	2056.5	2062.9
7.5°	2075.6	2075.6	2069.2	2072.4	2066.0	2069.2	2066.0	2072.4	2069.2	2069.2	2072.4
10°	2085.1	2088.3	2081.9	2078.7	2078.7	2081.9	2085.1	2088.3	2085.1	2085.1	2091.4
12.5°	2101.0	2104.1	2097.8	2094.6	2094.6	2097.8	2101.0	2107.3	2097.8	2097.8	2097.8
15°	2116.8	2116.8	2113.6	2110.5	2113.6	2116.8	2116.8	2123.2	2116.8	2110.5	2110.5
17.5°	2123.2	2126.3	2123.2	2129.5	2132.7	2135.9	2139.0	2139.0	2129.5	2126.3	2126.3
20°	2145.4	2148.6	2142.2	2145.4	2154.9	2167.6	2167.6	2167.6	2167.6	2158.1	2158.1
22.5°	2183.5	2186.6	2183.5	2183.5	2196.2	2208.9	2208.9	2218.4	2205.7	2199.3	2199.3
25°	2246.9	2246.9	2243.8	2246.9	2253.3	2259.6	2272.3	2278.7	2278.7	2275.5	2278.7
27.5°	2323.1	2326.3	2323.1	2323.1	2319.9	2332.6	2351.7	2361.2	2364.4	2367.5	2367.5
30°	2424.7	2431.0	2427.8	2431.0	2437.4	2446.9	2453.2	2456.4	2456.4	2450.1	2450.1
32.5°	2535.7	2542.1	2535.7	2551.6	2573.8	2573.8	2567.5	2580.2	2570.7	2564.3	2558.0
35°	2665.9	2665.9	2672.2	2678.6	2710.3	2726.2	2726.2	2719.8	2700.8	2691.2	2697.6
37.5°	2815.0	2818.2	2824.5	2827.7	2856.3	2884.8	2881.7	2865.8	2843.6	2818.2	2818.2
40°	2992.7	2986.4	2989.6	3011.8	3034.0	3068.9	3072.1	3049.9	3011.8	2986.4	2986.4
42.5°	3154.6	3157.8	3170.5	3199.0	3249.8	3278.4	3262.5	3224.4	3183.2	3151.4	3148.3
45°	3326.0	3322.8	3357.7	3418.0	3484.7	3519.6	3494.2	3440.2	3376.8	3335.5	3335.5
47.5°	3500.5	3497.4	3554.5	3652.9	3738.6	3767.1	3741.7	3671.9	3586.2	3525.9	3516.4
50°	3681.4	3694.1	3754.4	3894.1	4005.1	4036.9	4005.1	3913.1	3798.9	3719.5	3706.8
52.5°	3887.7	3897.2	3976.6	4128.9	4265.4	4338.4	4290.8	4154.3	4008.3	3913.1	3900.4
55°	4078.1	4084.5	4198.7	4382.8	4551.0	4649.4	4573.2	4398.7	4214.6	4094.0	4081.3
57.5°	4211.4	4227.3	4373.3	4611.3	4827.1	4941.4	4827.1	4639.9	4395.5	4246.3	4236.8
60°	4297.1	4322.5	4490.7	4789.0	5087.4	5211.1	5093.7	4833.5	4532.0	4338.4	4328.9
62.5°	4252.7	4287.6	4503.4	4893.8	5309.5	5442.8	5290.5	4925.5	4516.1	4271.7	4246.3
65°	3941.7	3967.1	4271.7	4817.6	5392.0	5598.3	5322.2	4823.9	4300.3	4030.5	3979.7
67.5°	3297.4	3341.8	3744.9	4449.4	5214.3	5452.3	5103.2	4459.0	3827.4	3497.4	3440.2
70°	2532.6	2611.9	3053.0	3817.9	4658.9	4928.7	4544.7	3763.9	3021.3	2684.9	2580.2
72.5°	1463.0	1586.8	2234.2	2980.1	3706.8	3909.9	3370.4	2631.0	2005.7	1767.7	1739.2
75°	485.6	530.0	1063.2	1716.9	2364.4	2465.9	2107.3	1659.8	1320.2	1129.8	1139.3
77.5°	238.0	238.0	320.5	628.4	1075.9	1269.5	1152.0	802.9	577.6	438.0	425.3
80°	190.4	190.4	222.2	307.8	361.8	425.3	361.8	263.4	215.8	196.8	206.3
82.5°	92.0	88.9	104.7	149.2	152.3	146.0	136.5	136.5	130.1	120.6	117.4
85°	6.3	6.3	12.7	28.6	47.6	63.5	73.0	69.8	66.6	57.1	63.5
87.5°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	6.3	6.3	6.3	6.3
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: SP1-2407-157-4

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-730-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-730-U-5WQ-2

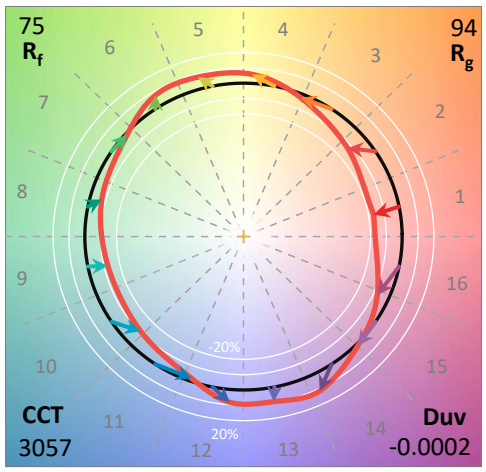
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-157-4
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-40-730-U-5WQ-2**
Description:	Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K):	3057	CRI (Ra):	71.7		
CIE u':	0.2487	R1:	68.1	R9:	-34.8
CIE v':	0.5199	R2:	82.0	R10:	58.5
Duv:	-0.0002	R3:	93.5	R11:	62.5
CIE x:	0.4326	R4:	67.5	R12:	47.5
CIE y:	0.4020	R5:	67.2	R13:	70.7
CIE z:	0.1654	R6:	74.9	R14:	96.4
Peak Wavelength (nm):	593	R7:	77.4	R15:	60.0
Dominant Wavelength (nm):	582	R8:	43.1		
Purity:	50.50735				
Rf:	74.6				
Rg:	94				



Test Conditions

Stabilization Time:	21M
Operation Time:	1H 21M
Sphere Temperature (°C):	24.2

REPORT NUMBER: SP1-2407-157-4

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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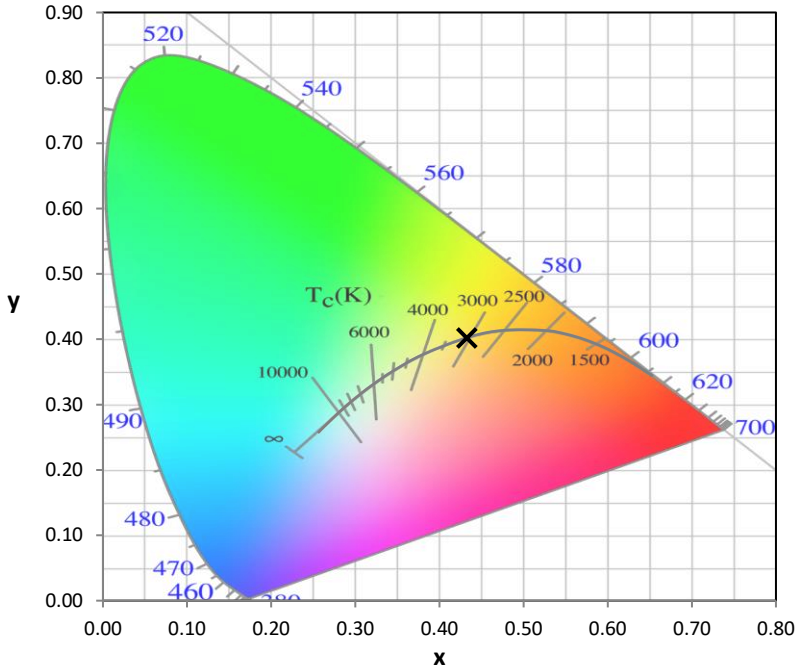
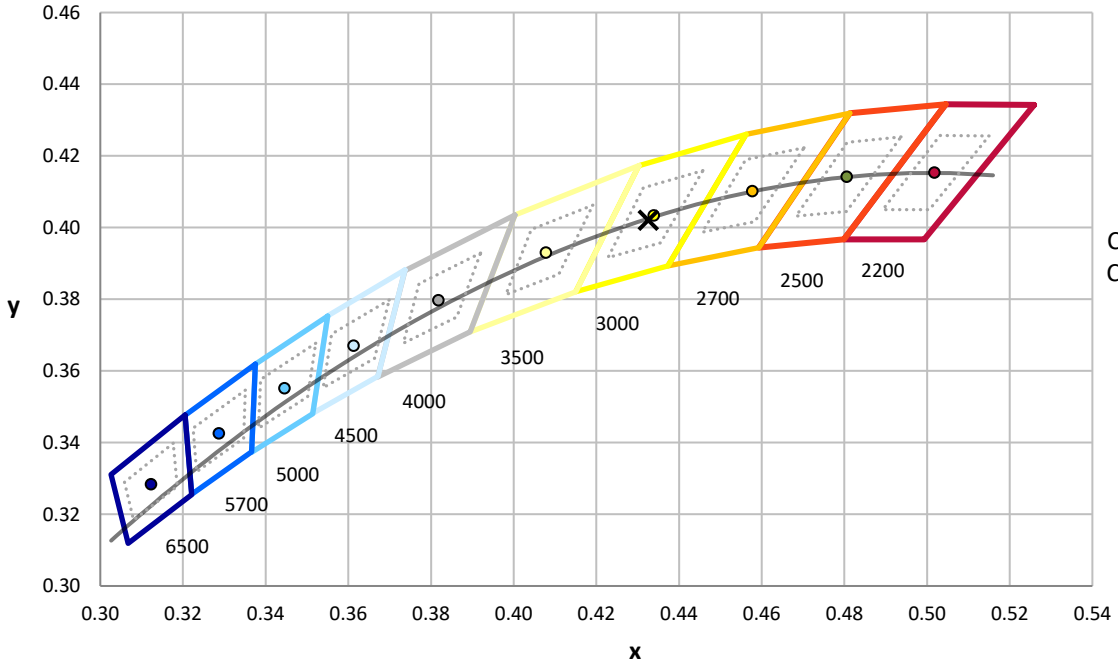
CIE 1931 Chromaticity Diagram



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



CCT = 3057K
CIE x = 0.4326
CIE y = 0.4020
Duv = -0.0002

Point lies inside the ANSI 3000K 4-step quadrangle

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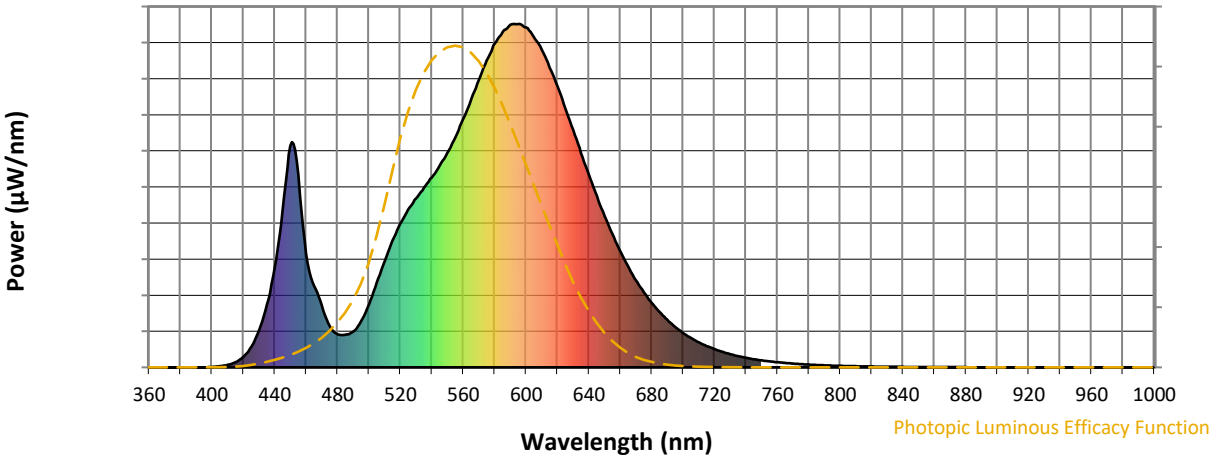
Photopic Flux vs. Wavelength

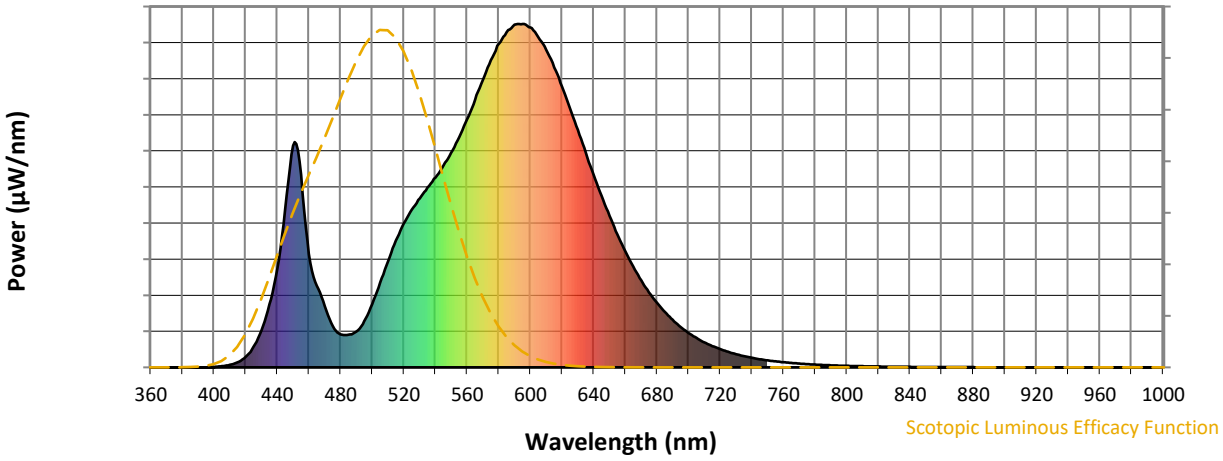


Photopic Lumens: NR

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	104	NR	620	818	NR	750	20	NR	880	1	NR
365	0	NR	495	135	NR	625	755	NR	755	17	NR	885	0	NR
370	0	NR	500	184	NR	630	691	NR	760	15	NR	890	0	NR
375	0	NR	505	247	NR	635	625	NR	765	13	NR	895	0	NR
380	0	NR	510	309	NR	640	561	NR	770	11	NR	900	0	NR
385	0	NR	515	369	NR	645	499	NR	775	9	NR	905	0	NR
390	0	NR	520	419	NR	650	441	NR	780	8	NR	910	0	NR
395	0	NR	525	460	NR	655	388	NR	785	7	NR	915	0	NR
400	1	NR	530	492	NR	660	338	NR	790	6	NR	920	0	NR
405	3	NR	535	524	NR	665	294	NR	795	5	NR	925	0	NR
410	7	NR	540	553	NR	670	253	NR	800	4	NR	930	0	NR
415	15	NR	545	588	NR	675	218	NR	805	4	NR	935	0	NR
420	31	NR	550	625	NR	680	188	NR	810	3	NR	940	0	NR
425	60	NR	555	670	NR	685	161	NR	815	3	NR	945	0	NR
430	107	NR	560	723	NR	690	139	NR	820	3	NR	950	0	NR
435	183	NR	565	780	NR	695	118	NR	825	2	NR	955	0	NR
440	289	NR	570	837	NR	700	100	NR	830	2	NR	960	0	NR
445	460	NR	575	894	NR	705	85	NR	835	2	NR	965	0	NR
450	646	NR	580	942	NR	710	73	NR	840	1	NR	970	0	NR
455	561	NR	585	976	NR	715	62	NR	845	1	NR	975	0	NR
460	331	NR	590	998	NR	720	53	NR	850	1	NR	980	0	NR
465	238	NR	595	1000	NR	725	45	NR	855	1	NR	985	0	NR
470	178	NR	600	990	NR	730	39	NR	860	1	NR	990	0	NR
475	120	NR	605	962	NR	735	33	NR	865	1	NR	995	0	NR
480	96	NR	610	925	NR	740	28	NR	870	1	NR	1000	0	NR
485	95	NR	615	873	NR	745	24	NR	875	1	NR			

REPORT NUMBER: SP1-2407-157-4

Scotopic Flux vs. Wavelength

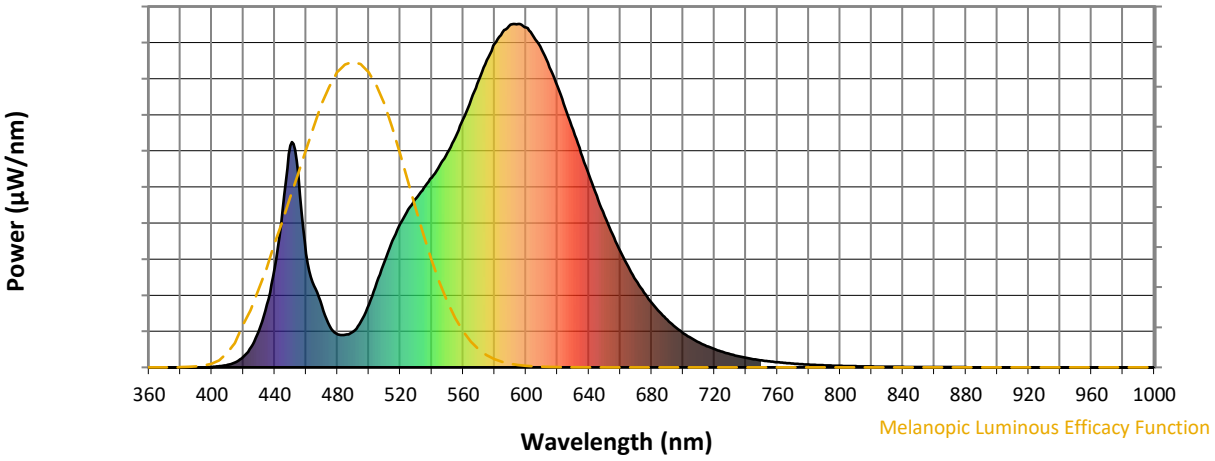


Scotopic Lumens: NR **S/P: 1.23**

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	104	NR	620	818	NR	750	20	NR	880	1	NR
365	0	NR	495	135	NR	625	755	NR	755	17	NR	885	0	NR
370	0	NR	500	184	NR	630	691	NR	760	15	NR	890	0	NR
375	0	NR	505	247	NR	635	625	NR	765	13	NR	895	0	NR
380	0	NR	510	309	NR	640	561	NR	770	11	NR	900	0	NR
385	0	NR	515	369	NR	645	499	NR	775	9	NR	905	0	NR
390	0	NR	520	419	NR	650	441	NR	780	8	NR	910	0	NR
395	0	NR	525	460	NR	655	388	NR	785	7	NR	915	0	NR
400	1	NR	530	492	NR	660	338	NR	790	6	NR	920	0	NR
405	3	NR	535	524	NR	665	294	NR	795	5	NR	925	0	NR
410	7	NR	540	553	NR	670	253	NR	800	4	NR	930	0	NR
415	15	NR	545	588	NR	675	218	NR	805	4	NR	935	0	NR
420	31	NR	550	625	NR	680	188	NR	810	3	NR	940	0	NR
425	60	NR	555	670	NR	685	161	NR	815	3	NR	945	0	NR
430	107	NR	560	723	NR	690	139	NR	820	3	NR	950	0	NR
435	183	NR	565	780	NR	695	118	NR	825	2	NR	955	0	NR
440	289	NR	570	837	NR	700	100	NR	830	2	NR	960	0	NR
445	460	NR	575	894	NR	705	85	NR	835	2	NR	965	0	NR
450	646	NR	580	942	NR	710	73	NR	840	1	NR	970	0	NR
455	561	NR	585	976	NR	715	62	NR	845	1	NR	975	0	NR
460	331	NR	590	998	NR	720	53	NR	850	1	NR	980	0	NR
465	238	NR	595	1000	NR	725	45	NR	855	1	NR	985	0	NR
470	178	NR	600	990	NR	730	39	NR	860	1	NR	990	0	NR
475	120	NR	605	962	NR	735	33	NR	865	1	NR	995	0	NR
480	96	NR	610	925	NR	740	28	NR	870	1	NR	1000	0	NR
485	95	NR	615	873	NR	745	24	NR	875	1	NR			

REPORT NUMBER: SP1-2407-157-4

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 2.27**

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	104	NR	620	818	NR	750	20	NR	880	1	NR
365	0	NR	495	135	NR	625	755	NR	755	17	NR	885	0	NR
370	0	NR	500	184	NR	630	691	NR	760	15	NR	890	0	NR
375	0	NR	505	247	NR	635	625	NR	765	13	NR	895	0	NR
380	0	NR	510	309	NR	640	561	NR	770	11	NR	900	0	NR
385	0	NR	515	369	NR	645	499	NR	775	9	NR	905	0	NR
390	0	NR	520	419	NR	650	441	NR	780	8	NR	910	0	NR
395	0	NR	525	460	NR	655	388	NR	785	7	NR	915	0	NR
400	1	NR	530	492	NR	660	338	NR	790	6	NR	920	0	NR
405	3	NR	535	524	NR	665	294	NR	795	5	NR	925	0	NR
410	7	NR	540	553	NR	670	253	NR	800	4	NR	930	0	NR
415	15	NR	545	588	NR	675	218	NR	805	4	NR	935	0	NR
420	31	NR	550	625	NR	680	188	NR	810	3	NR	940	0	NR
425	60	NR	555	670	NR	685	161	NR	815	3	NR	945	0	NR
430	107	NR	560	723	NR	690	139	NR	820	3	NR	950	0	NR
435	183	NR	565	780	NR	695	118	NR	825	2	NR	955	0	NR
440	289	NR	570	837	NR	700	100	NR	830	2	NR	960	0	NR
445	460	NR	575	894	NR	705	85	NR	835	2	NR	965	0	NR
450	646	NR	580	942	NR	710	73	NR	840	1	NR	970	0	NR
455	561	NR	585	976	NR	715	62	NR	845	1	NR	975	0	NR
460	331	NR	590	998	NR	720	53	NR	850	1	NR	980	0	NR
465	238	NR	595	1000	NR	725	45	NR	855	1	NR	985	0	NR
470	178	NR	600	990	NR	730	39	NR	860	1	NR	990	0	NR
475	120	NR	605	962	NR	735	33	NR	865	1	NR	995	0	NR
480	96	NR	610	925	NR	740	28	NR	870	1	NR	1000	0	NR
485	95	NR	615	873	NR	745	24	NR	875	1	NR			

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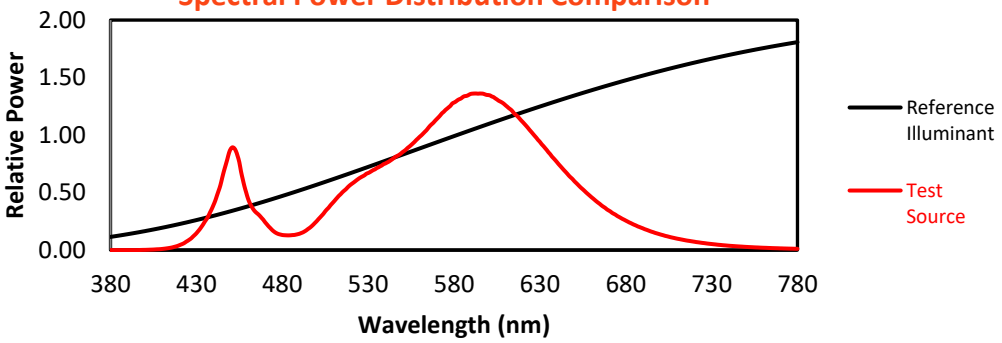
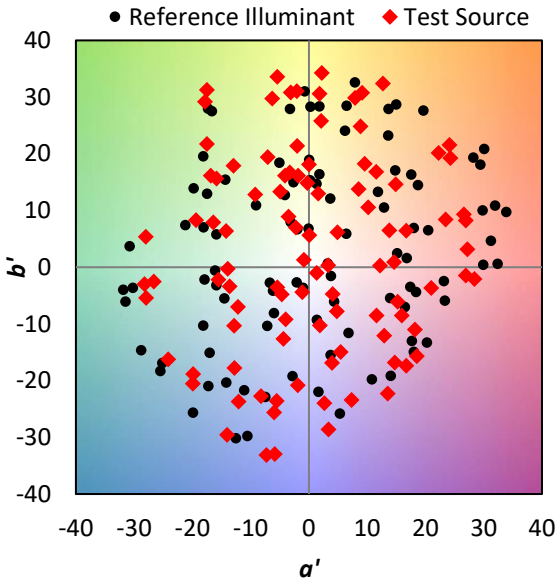
Summary

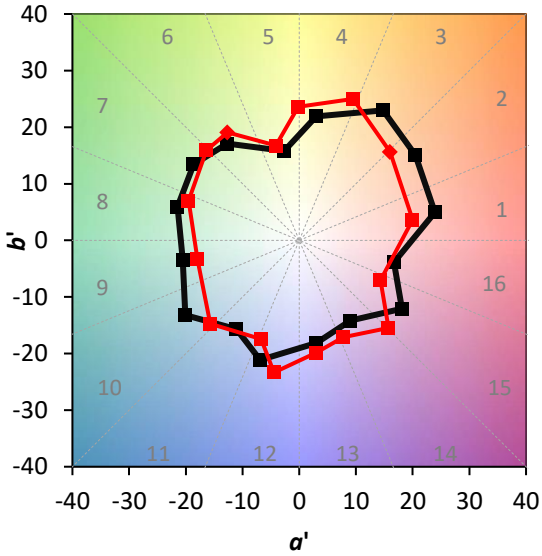
R_f = 74.6
R_g = 94
CIE R_a = 71.7
R_9 = -34.8

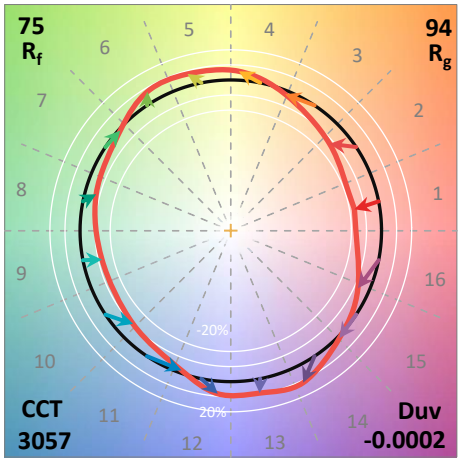
Spectral Power Distribution Comparison

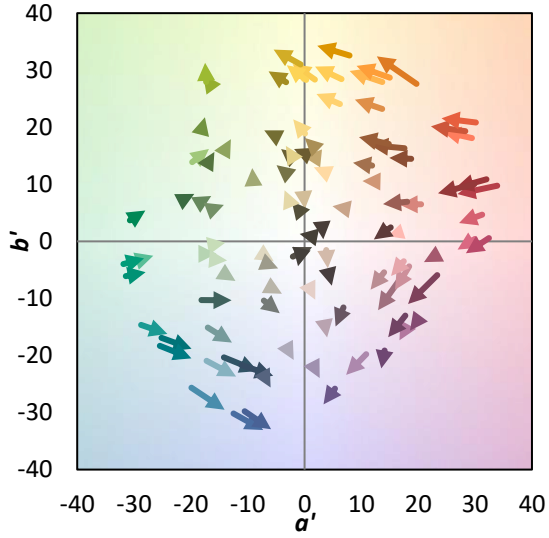


Color Vector Graphics









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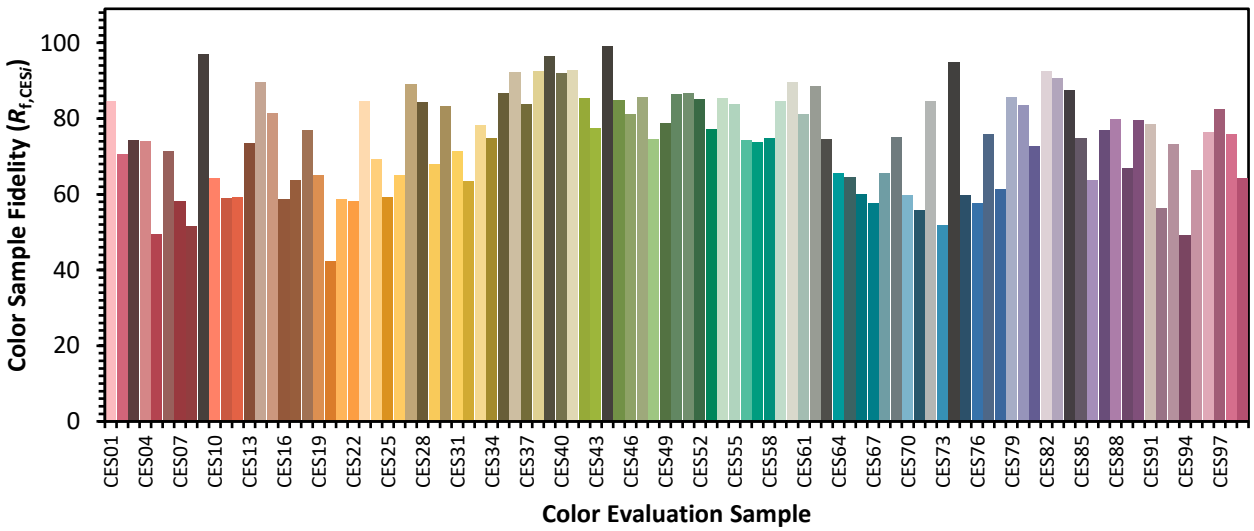
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 65	CES51 = 87	CES76 = 58
CES02 = 62	CES27 = 89	CES52 = 85	CES77 = 76
CES03 = 31	CES28 = 84	CES53 = 77	CES78 = 61
CES04 = 71	CES29 = 68	CES54 = 85	CES79 = 86
CES05 = 49	CES30 = 83	CES55 = 84	CES80 = 83
CES06 = 51	CES31 = 71	CES56 = 74	CES81 = 73
CES07 = 41	CES32 = 64	CES57 = 74	CES82 = 93
CES08 = 40	CES33 = 78	CES58 = 75	CES83 = 91
CES09 = 29	CES34 = 75	CES59 = 85	CES84 = 88
CES10 = 76	CES35 = 87	CES60 = 90	CES85 = 75
CES11 = 59	CES36 = 92	CES61 = 81	CES86 = 64
CES12 = 65	CES37 = 84	CES62 = 89	CES87 = 77
CES13 = 43	CES38 = 92	CES63 = 75	CES88 = 80
CES14 = 74	CES39 = 96	CES64 = 65	CES89 = 67
CES15 = 71	CES40 = 92	CES65 = 64	CES90 = 80
CES16 = 47	CES41 = 93	CES66 = 60	CES91 = 78
CES17 = 50	CES42 = 86	CES67 = 58	CES92 = 56
CES18 = 56	CES43 = 77	CES68 = 66	CES93 = 73
CES19 = 73	CES44 = 99	CES69 = 75	CES94 = 49
CES20 = 66	CES45 = 85	CES70 = 60	CES95 = 66
CES21 = 87	CES46 = 81	CES71 = 56	CES96 = 76
CES22 = 79	CES47 = 86	CES72 = 85	CES97 = 82
CES23 = 92	CES48 = 75	CES73 = 52	CES98 = 76
CES24 = 91	CES49 = 79	CES74 = 95	CES99 = 64
CES25 = 73	CES50 = 86	CES75 = 60	



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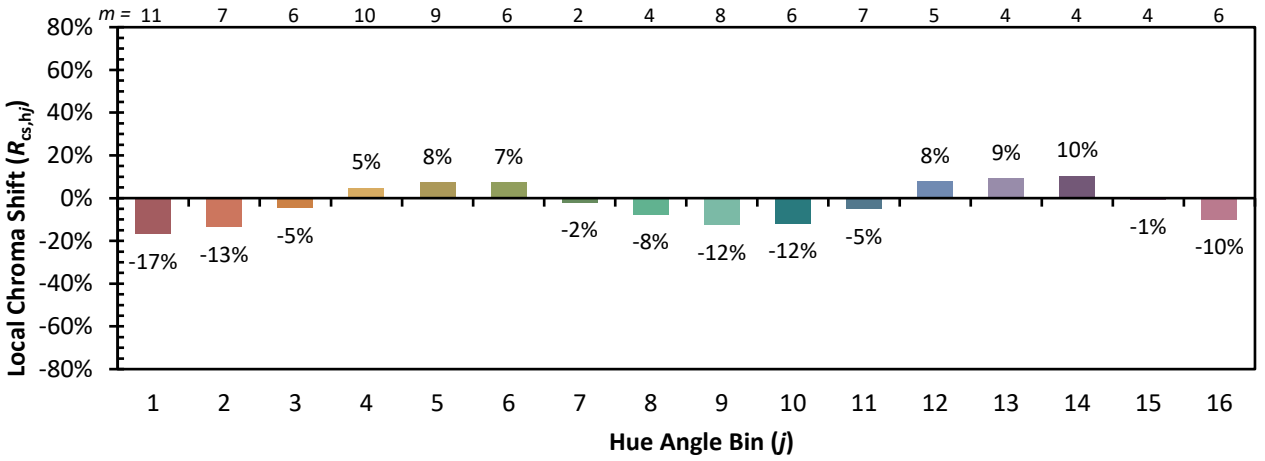
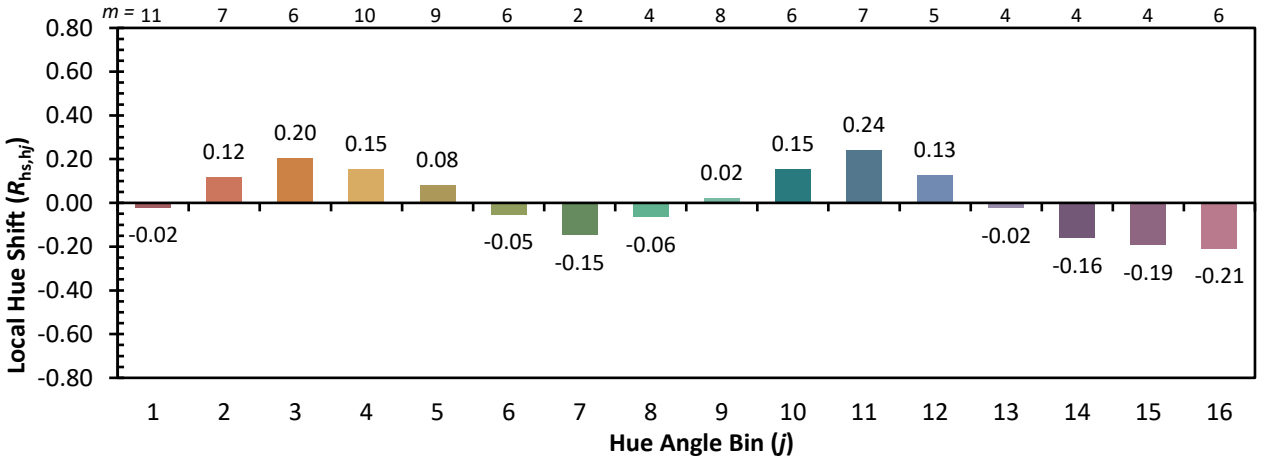
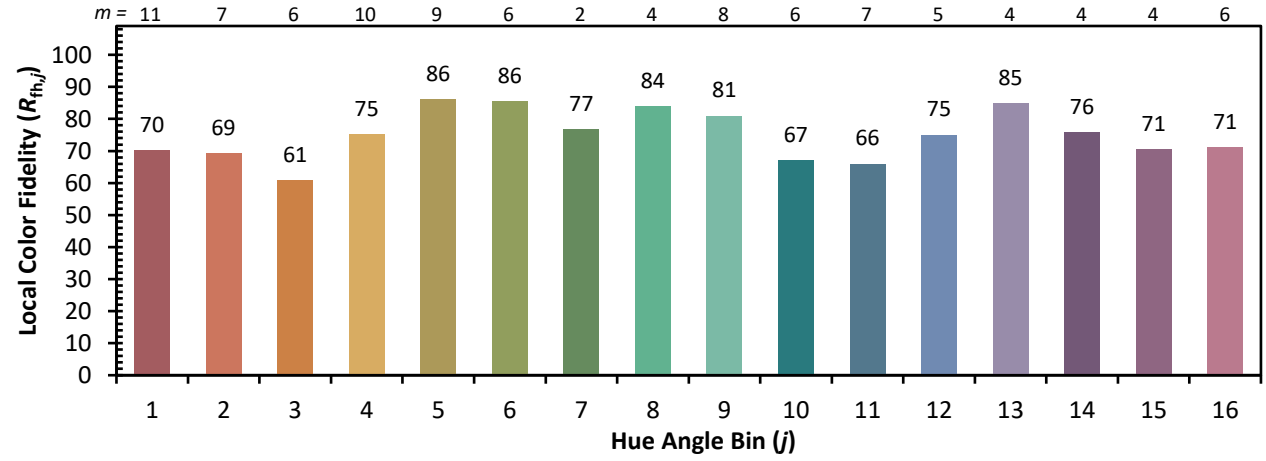
Color Rendition by Hue-Angle Bin







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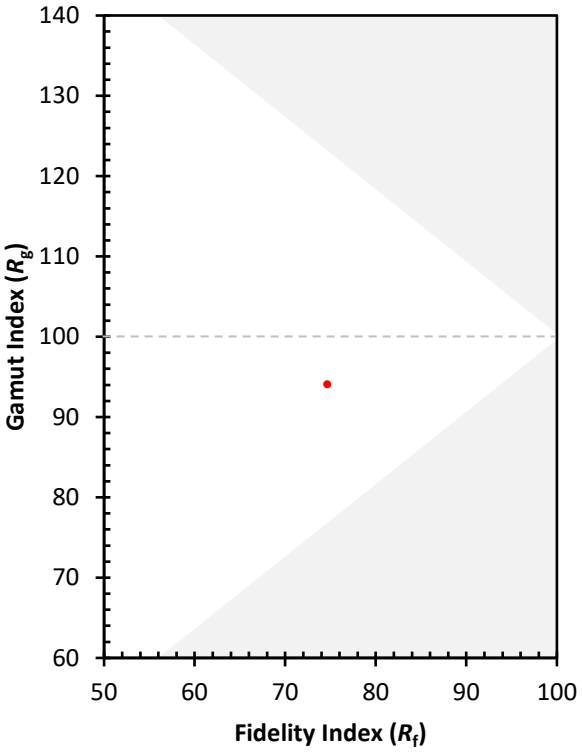
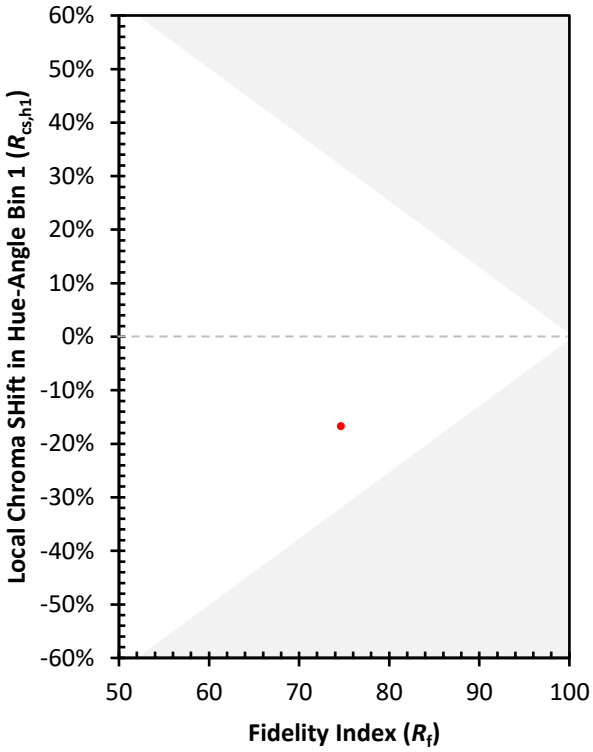
Measure Comparisons





(END OF REPORT)