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: P869155

Luminaire Tested: **EMM2-HSN-SA2B-727-U-T5W**

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:	P869155
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	08/22/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HSN-SA2B-727-U-T5W
Description:	EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 70CRI 2700K FIXTURE w/ TYPE V SQUARE WIDE DISTRIBUTION OPTIC
Light Source:	(20) 2700K CCT, 70 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	12243 lumens
Efficiency:	N/A
Efficacy:	136.0 lumens/watt
Luminous Opening:	Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B4 - U0 - G2

Input Watts (W):	90
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.99
Total Harmonic Distortion (THDi):	6.20%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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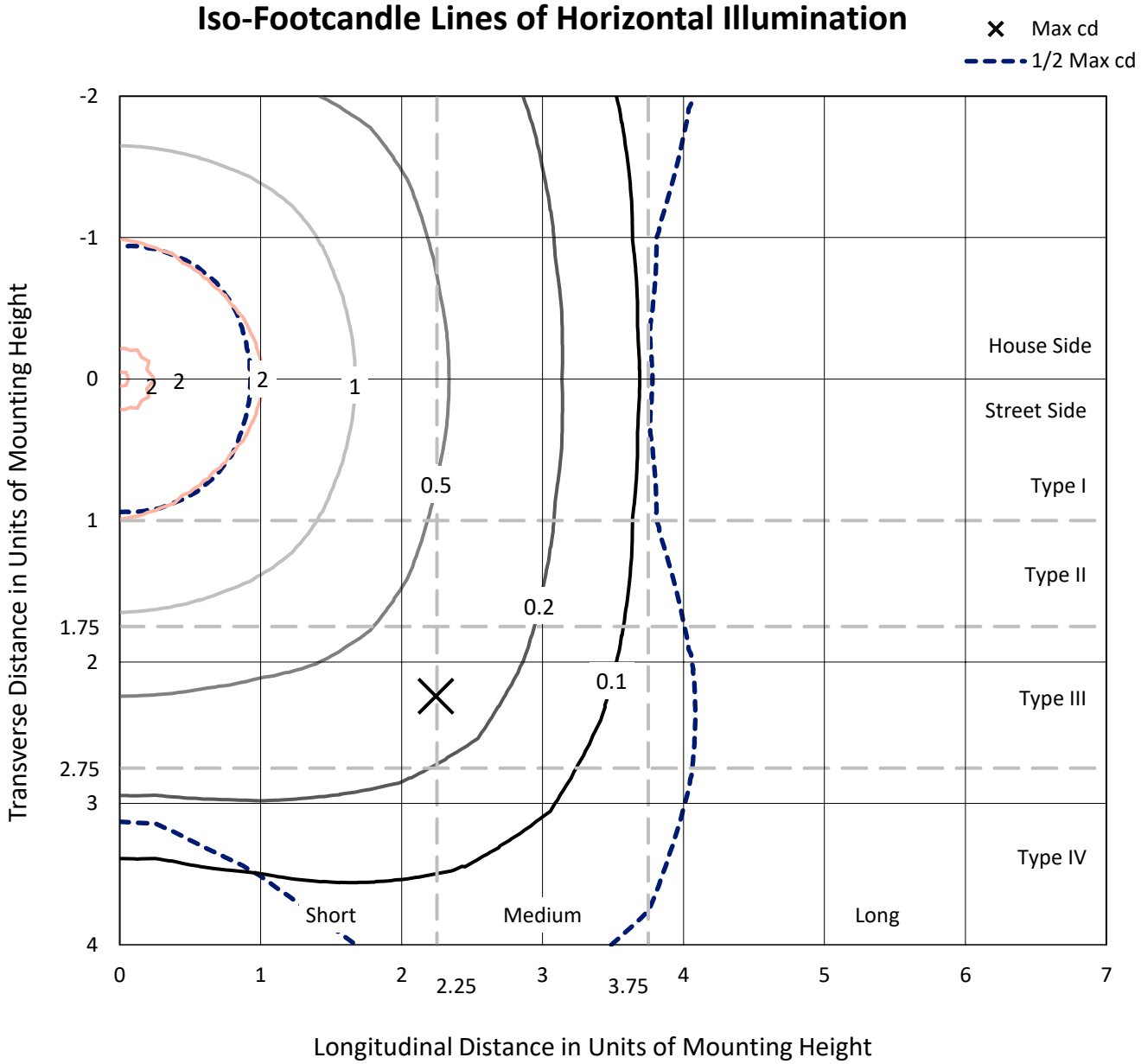
Scaled Data Report

REPORT NUMBER: P869155
CATALOG NUMBER: EMM2-HSN-SA2B-727-U-T5W

Iso-Footcandle Lines of Horizontal Illumination



Based on 20 foot mounting height. Maximum calculated value = 2.2 fc
Type V - Short - N/A

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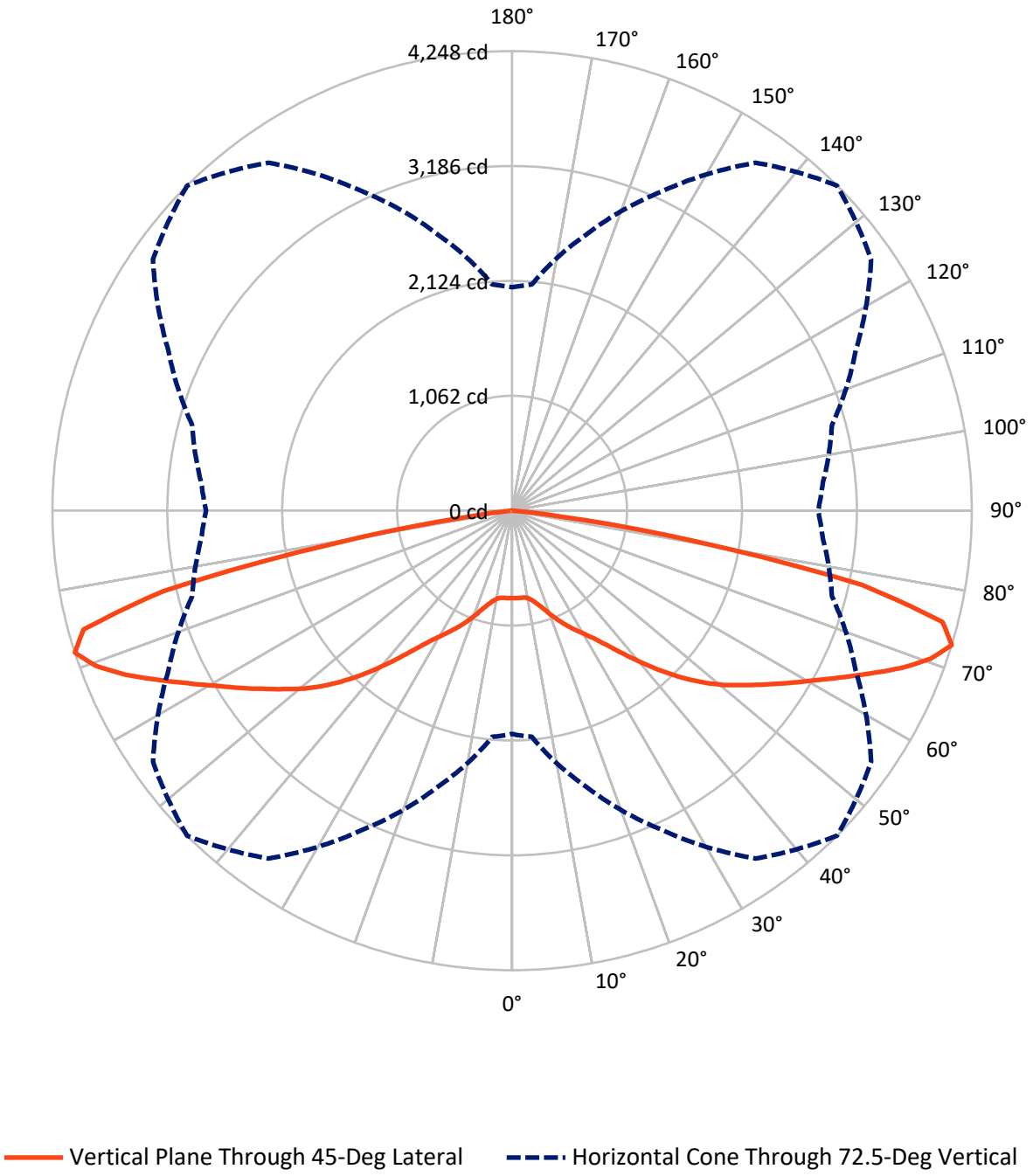
Luminous Intensity Polar Plot



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REPORT NUMBER: P869155
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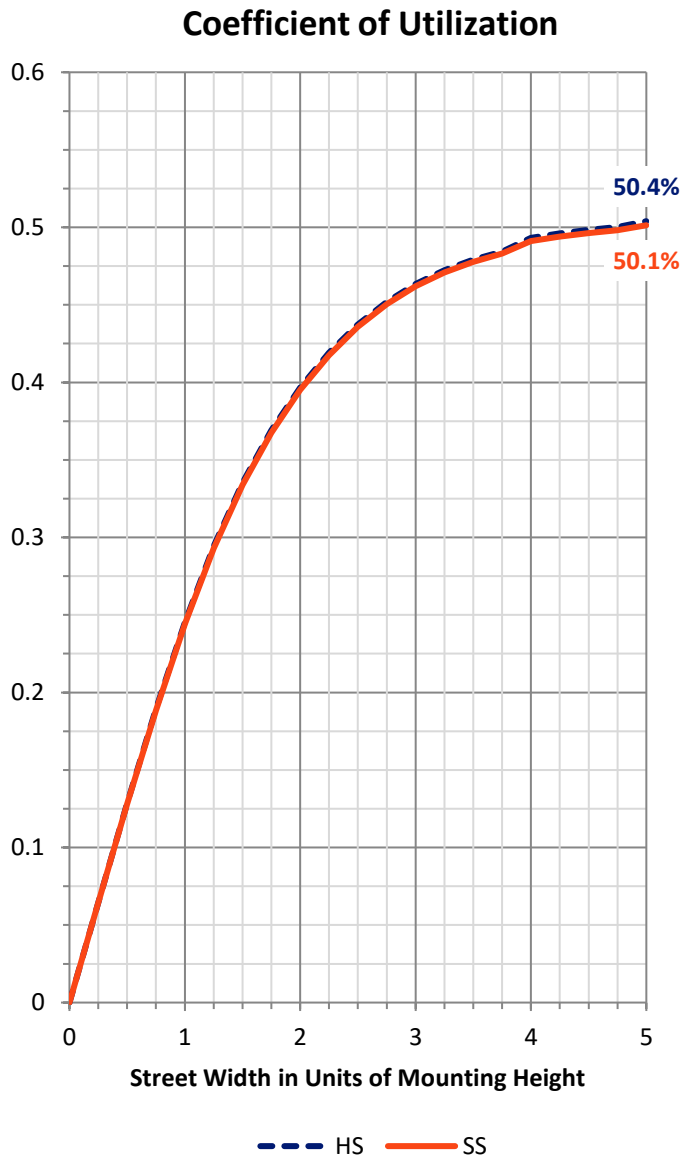
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	6121.5	0.0	6121.5
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	6121.5	0.0	6121.5
	% Fixture	50.0	0.0	50.0
Total	Lumens	12243.0	0.0	12243.0
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	77.5	0.6
10°-20°	258.5	2.1
20°-30°	533.4	4.4
30°-40°	982.0	8.0
40°-50°	1726.7	14.1
50°-60°	2504.3	20.5
60°-70°	3264.7	26.7
70°-80°	2713.7	22.2
80°-90°	182.2	1.5
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°	12243.0	100.0
0°-180°	12243.0	100.0



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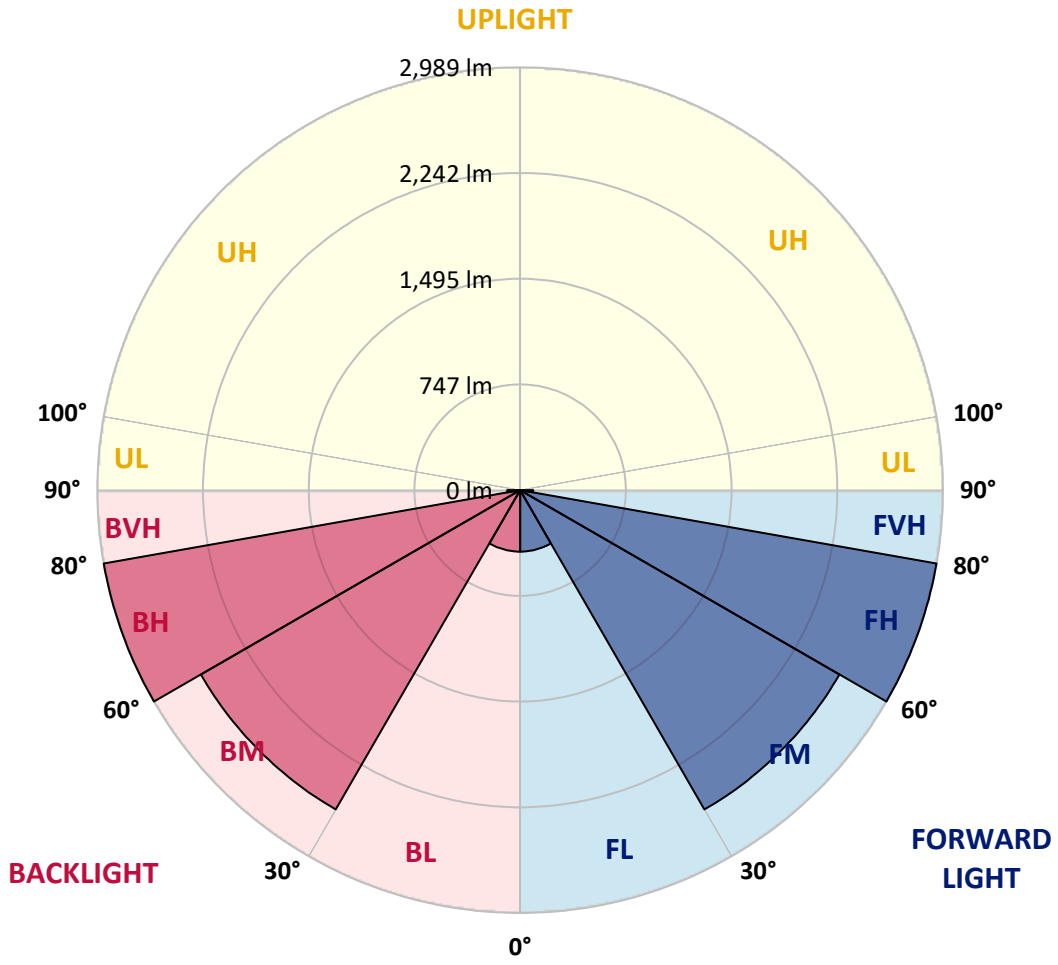
LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	434.7	3.6			
FM	(30°-60°)	2606.5	21.3			
FH	(60°-80°)	2989.2	24.4			G2/5000
FVH	(80°-90°)	91.1	0.7			G1/100
BL	(0°-30°)	434.7	3.6	B1/500		
BM	(30°-60°)	2606.5	21.3	B3/5000		
BH	(60°-80°)	2989.2	24.4	B4/5000		G2/5000
BVH	(80°-90°)	91.1	0.7			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: P869155
CATALOG NUMBER: EMM2-HSN-SA2B-727-U-T5W

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	808.3	808.3	808.3	808.3	808.3	*808.3*	808.3	808.3	808.3	808.3	808.3
2.5°	805.7	807.0	807.0	807.0	808.3	*809.5*	810.8	812.1	814.6	815.9	815.9
5°	809.5	808.3	807.0	809.5	809.5	*809.5*	810.8	812.1	812.1	812.1	813.3
7.5°	805.7	807.0	805.7	805.7	809.5	*810.8*	809.5	808.3	808.3	809.5	809.5
10°	819.7	818.4	817.1	817.1	820.9	*822.2*	820.9	819.7	819.7	822.2	822.2
12.5°	851.4	853.9	846.3	846.3	851.4	*853.9*	850.1	848.9	850.1	852.7	852.7
15°	900.9	899.6	894.5	889.5	894.5	*898.3*	893.3	890.7	892.0	898.3	893.3
17.5°	955.4	956.7	951.6	946.6	950.4	*955.4*	947.8	941.5	942.8	945.3	942.8
20°	1016.3	1015.1	1013.8	1013.8	1021.4	*1027.8*	1016.3	1001.1	997.3	994.8	994.8
22.5°	1060.8	1064.6	1065.8	1077.2	1095.0	*1101.4*	1086.1	1065.8	1050.6	1043.0	1037.9
25°	1130.5	1126.7	1124.2	1136.9	1163.5	*1174.9*	1155.9	1128.0	1112.8	1111.5	1115.3
27.5°	1194.0	1194.0	1199.1	1211.7	1237.1	*1248.5*	1232.0	1204.1	1196.5	1196.5	1192.7
30°	1276.5	1272.7	1277.7	1299.3	1318.3	*1325.9*	1312.0	1293.0	1286.6	1286.6	1280.3
32.5°	1372.9	1374.2	1381.8	1395.7	1414.8	*1416.0*	1411.0	1402.1	1398.3	1394.5	1400.8
35°	1520.1	1520.1	1517.5	1527.7	1532.8	*1535.3*	1537.8	1534.0	1534.0	1534.0	1529.0
37.5°	1702.8	1692.6	1691.4	1682.5	1676.1	*1682.5*	1693.9	1706.6	1716.7	1710.4	1707.9
40°	1884.2	1879.2	1863.9	1850.0	1844.9	*1847.4*	1861.4	1888.0	1899.5	1899.5	1909.6
42.5°	2079.6	2069.5	2050.5	2034.0	2020.0	*2023.8*	2036.5	2069.5	2094.9	2106.3	2101.2
45°	2254.7	2245.9	2226.8	2211.6	2201.4	*2200.2*	2216.7	2238.2	2272.5	2282.7	2290.3
47.5°	2404.5	2398.1	2381.6	2366.4	2370.2	*2371.5*	2376.5	2395.6	2423.5	2437.4	2436.2
50°	2526.3	2521.2	2506.0	2512.3	2522.5	*2532.6*	2526.3	2539.0	2556.7	2563.1	2568.1
52.5°	2637.9	2630.3	2620.2	2631.6	2658.2	*2678.5*	2682.3	2673.5	2678.5	2682.3	2678.5
55°	2748.3	2739.4	2736.9	2757.2	2797.8	*2835.9*	2832.1	2806.7	2800.3	2792.7	2788.9
57.5°	2838.4	2832.1	2842.2	2876.5	2955.1	*3005.9*	2989.4	2931.0	2905.7	2887.9	2882.8
60°	2895.5	2894.2	2917.1	2997.0	3116.3	*3187.3*	3160.7	3060.5	3003.4	2986.9	2979.2
62.5°	2926.0	2927.2	2967.8	3109.9	3300.3	*3396.7*	3349.7	3196.2	3107.4	3090.9	3093.4
65°	2953.9	2950.1	3003.4	3205.1	3499.5	*3630.2*	3566.7	3359.9	3230.5	3197.5	3197.5
67.5°	2974.2	2978.0	3057.9	3300.3	3693.6	*3880.1*	3787.5	3533.7	3362.4	3313.0	3306.6
70°	2717.9	2754.7	3004.6	3363.7	3847.1	*4100.9*	3979.1	3640.3	3367.5	3226.7	3212.7
72.5°	*2064.4*	*2098.7*	*2639.2*	*3250.8*	*3925.8*	*4248.1*	*4050.1*	*3504.5*	*3060.5*	*2881.5*	*2828.3*
75°	1361.5	1385.6	1966.7	2839.7	3707.6	*4108.5*	3688.5	3018.6	2409.5	2177.3	2191.3
77.5°	606.5	683.9	1253.6	2215.4	3054.1	*3306.6*	2813.0	2059.3	1471.9	1246.0	1221.9
80°	253.8	277.9	473.3	1181.3	1770.0	*1693.9*	1197.8	690.3	439.0	341.3	329.9
82.5°	73.6	76.1	93.9	204.3	360.4	*423.8*	255.0	129.4	123.1	97.7	90.1
85°	5.1	5.1	7.6	12.7	17.8	*29.2*	33.0	38.1	43.1	36.8	36.8
87.5°	2.5	2.5	2.5	3.8	3.8	*5.1*	3.8	3.8	3.8	3.8	3.8
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: SP1-2407-157-3

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-727-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-727-U-5WQ-2

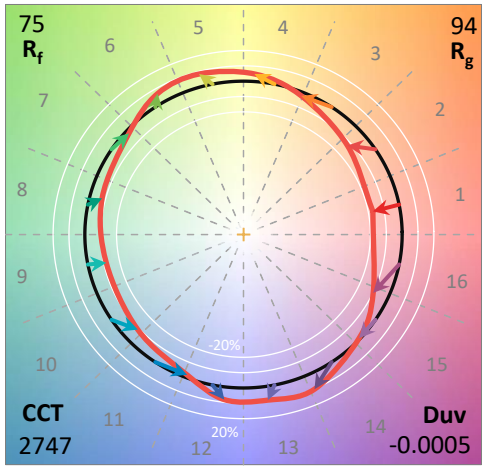
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-157-3
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-40-727-U-5WQ-2**
Description:	Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K):	2747	CRI (Ra):	71.7		
CIE u':	0.2606	R1:	68.1	R9:	-35.3
CIE v':	0.5257	R2:	83.9	R10:	64.2
Duv:	-0.0005	R3:	94.7	R11:	61.7
CIE x:	0.4552	R4:	66.3	R12:	53.9
CIE y:	0.4082	R5:	67.4	R13:	71.2
CIE z:	0.1366	R6:	78.7	R14:	97.6
Peak Wavelength (nm):	597	R7:	75.0	R15:	59.3
Dominant Wavelength (nm):	584	R8:	39.4		
Purity:	59.16856				
Rf:	75.5				
Rg:	93.6				



Test Conditions

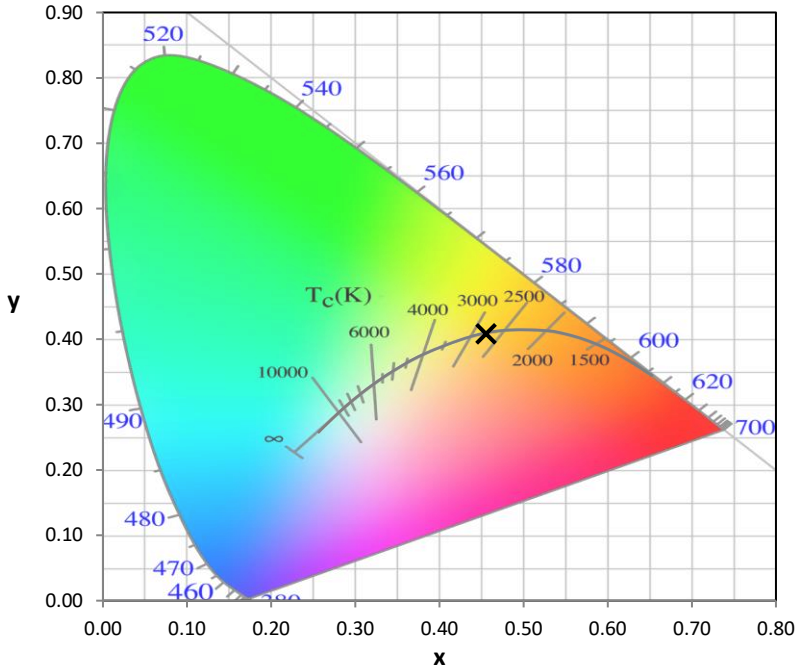
Stabilization Time:	22M
Operation Time:	1H 22M
Sphere Temperature (°C):	24.2

REPORT NUMBER: SP1-2407-157-3

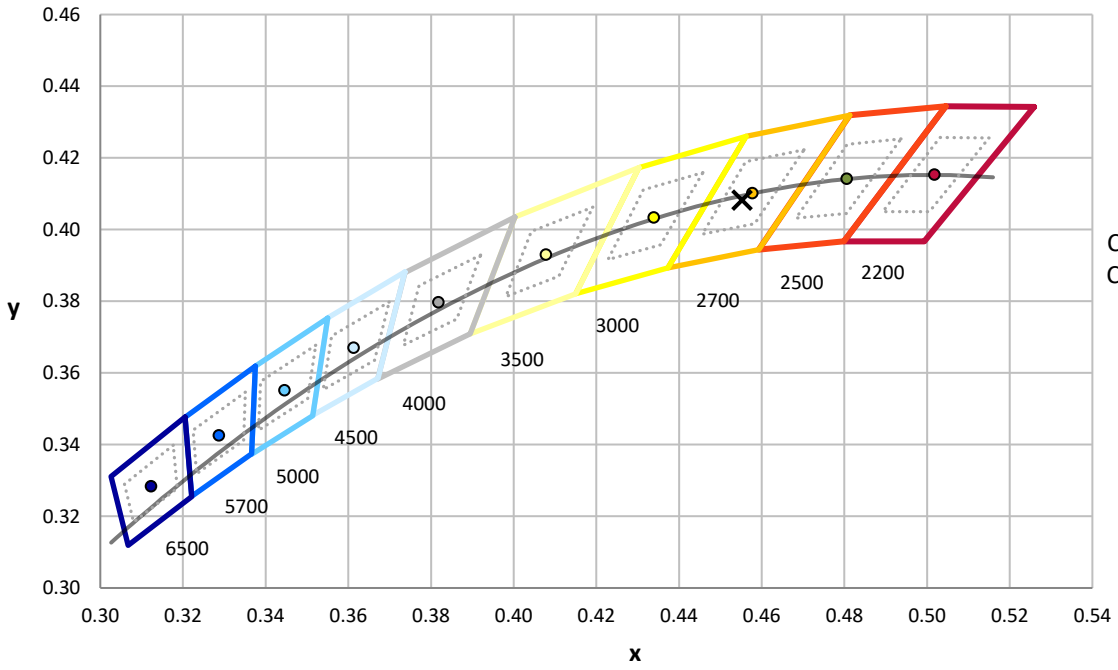
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085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

REPORT NUMBER: SP1-2407-157-3

CIE 1931 Chromaticity Diagram



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



CCT = 2747K
CIE x = 0.4552
CIE y = 0.4082
Duv = -0.0005

Point lies inside the ANSI 2700K 4-step quadrangle

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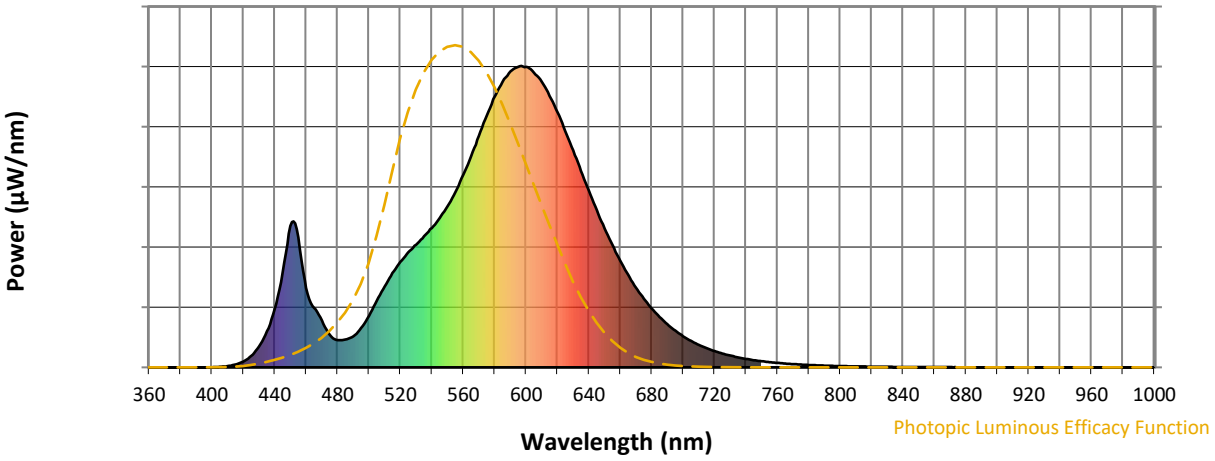
Photopic Flux vs. Wavelength

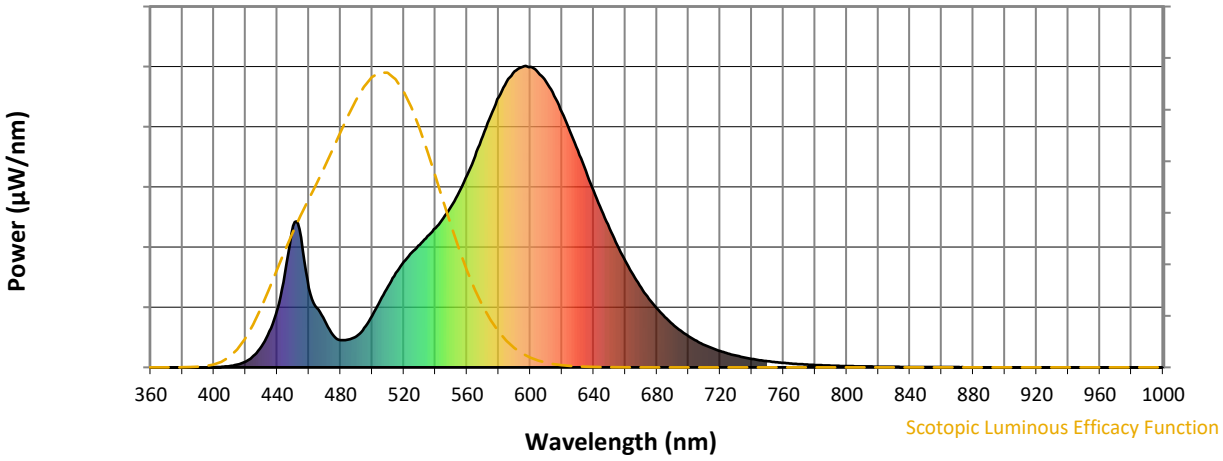


Photopic Lumens: NR

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	103	NR	620	846	NR	750	20	NR	880	0	NR
365	0	NR	495	130	NR	625	784	NR	755	17	NR	885	1	NR
370	0	NR	500	171	NR	630	720	NR	760	15	NR	890	0	NR
375	0	NR	505	221	NR	635	652	NR	765	13	NR	895	0	NR
380	0	NR	510	268	NR	640	587	NR	770	11	NR	900	0	NR
385	0	NR	515	313	NR	645	521	NR	775	9	NR	905	0	NR
390	0	NR	520	350	NR	650	461	NR	780	8	NR	910	0	NR
395	0	NR	525	381	NR	655	406	NR	785	7	NR	915	0	NR
400	0	NR	530	407	NR	660	353	NR	790	6	NR	920	0	NR
405	2	NR	535	435	NR	665	307	NR	795	5	NR	925	0	NR
410	4	NR	540	462	NR	670	264	NR	800	4	NR	930	0	NR
415	9	NR	545	496	NR	675	227	NR	805	4	NR	935	0	NR
420	20	NR	550	534	NR	680	196	NR	810	3	NR	940	0	NR
425	38	NR	555	582	NR	685	167	NR	815	3	NR	945	0	NR
430	69	NR	560	638	NR	690	144	NR	820	2	NR	950	0	NR
435	120	NR	565	700	NR	695	122	NR	825	2	NR	955	0	NR
440	193	NR	570	767	NR	700	103	NR	830	2	NR	960	0	NR
445	316	NR	575	836	NR	705	88	NR	835	2	NR	965	0	NR
450	469	NR	580	898	NR	710	74	NR	840	1	NR	970	0	NR
455	431	NR	585	947	NR	715	63	NR	845	1	NR	975	0	NR
460	264	NR	590	982	NR	720	54	NR	850	1	NR	980	0	NR
465	197	NR	595	997	NR	725	46	NR	855	1	NR	985	0	NR
470	155	NR	600	997	NR	730	39	NR	860	1	NR	990	0	NR
475	108	NR	605	978	NR	735	33	NR	865	1	NR	995	0	NR
480	90	NR	610	947	NR	740	28	NR	870	1	NR	1000	0	NR
485	92	NR	615	900	NR	745	24	NR	875	1	NR			

REPORT NUMBER: SP1-2407-157-3

Scotopic Flux vs. Wavelength

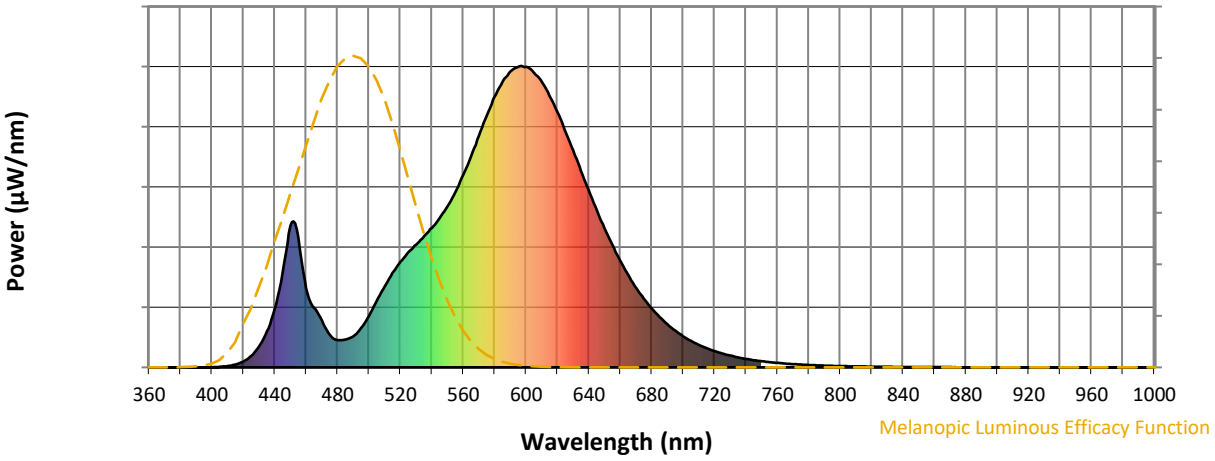


Scotopic Lumens: NR **S/P: 1.13**

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	103	NR	620	846	NR	750	20	NR	880	0	NR
365	0	NR	495	130	NR	625	784	NR	755	17	NR	885	1	NR
370	0	NR	500	171	NR	630	720	NR	760	15	NR	890	0	NR
375	0	NR	505	221	NR	635	652	NR	765	13	NR	895	0	NR
380	0	NR	510	268	NR	640	587	NR	770	11	NR	900	0	NR
385	0	NR	515	313	NR	645	521	NR	775	9	NR	905	0	NR
390	0	NR	520	350	NR	650	461	NR	780	8	NR	910	0	NR
395	0	NR	525	381	NR	655	406	NR	785	7	NR	915	0	NR
400	0	NR	530	407	NR	660	353	NR	790	6	NR	920	0	NR
405	2	NR	535	435	NR	665	307	NR	795	5	NR	925	0	NR
410	4	NR	540	462	NR	670	264	NR	800	4	NR	930	0	NR
415	9	NR	545	496	NR	675	227	NR	805	4	NR	935	0	NR
420	20	NR	550	534	NR	680	196	NR	810	3	NR	940	0	NR
425	38	NR	555	582	NR	685	167	NR	815	3	NR	945	0	NR
430	69	NR	560	638	NR	690	144	NR	820	2	NR	950	0	NR
435	120	NR	565	700	NR	695	122	NR	825	2	NR	955	0	NR
440	193	NR	570	767	NR	700	103	NR	830	2	NR	960	0	NR
445	316	NR	575	836	NR	705	88	NR	835	2	NR	965	0	NR
450	469	NR	580	898	NR	710	74	NR	840	1	NR	970	0	NR
455	431	NR	585	947	NR	715	63	NR	845	1	NR	975	0	NR
460	264	NR	590	982	NR	720	54	NR	850	1	NR	980	0	NR
465	197	NR	595	997	NR	725	46	NR	855	1	NR	985	0	NR
470	155	NR	600	997	NR	730	39	NR	860	1	NR	990	0	NR
475	108	NR	605	978	NR	735	33	NR	865	1	NR	995	0	NR
480	90	NR	610	947	NR	740	28	NR	870	1	NR	1000	0	NR
485	92	NR	615	900	NR	745	24	NR	875	1	NR			

REPORT NUMBER: SP1-2407-157-3

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 2.04**

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	103	NR	620	846	NR	750	20	NR	880	0	NR
365	0	NR	495	130	NR	625	784	NR	755	17	NR	885	1	NR
370	0	NR	500	171	NR	630	720	NR	760	15	NR	890	0	NR
375	0	NR	505	221	NR	635	652	NR	765	13	NR	895	0	NR
380	0	NR	510	268	NR	640	587	NR	770	11	NR	900	0	NR
385	0	NR	515	313	NR	645	521	NR	775	9	NR	905	0	NR
390	0	NR	520	350	NR	650	461	NR	780	8	NR	910	0	NR
395	0	NR	525	381	NR	655	406	NR	785	7	NR	915	0	NR
400	0	NR	530	407	NR	660	353	NR	790	6	NR	920	0	NR
405	2	NR	535	435	NR	665	307	NR	795	5	NR	925	0	NR
410	4	NR	540	462	NR	670	264	NR	800	4	NR	930	0	NR
415	9	NR	545	496	NR	675	227	NR	805	4	NR	935	0	NR
420	20	NR	550	534	NR	680	196	NR	810	3	NR	940	0	NR
425	38	NR	555	582	NR	685	167	NR	815	3	NR	945	0	NR
430	69	NR	560	638	NR	690	144	NR	820	2	NR	950	0	NR
435	120	NR	565	700	NR	695	122	NR	825	2	NR	955	0	NR
440	193	NR	570	767	NR	700	103	NR	830	2	NR	960	0	NR
445	316	NR	575	836	NR	705	88	NR	835	2	NR	965	0	NR
450	469	NR	580	898	NR	710	74	NR	840	1	NR	970	0	NR
455	431	NR	585	947	NR	715	63	NR	845	1	NR	975	0	NR
460	264	NR	590	982	NR	720	54	NR	850	1	NR	980	0	NR
465	197	NR	595	997	NR	725	46	NR	855	1	NR	985	0	NR
470	155	NR	600	997	NR	730	39	NR	860	1	NR	990	0	NR
475	108	NR	605	978	NR	735	33	NR	865	1	NR	995	0	NR
480	90	NR	610	947	NR	740	28	NR	870	1	NR	1000	0	NR
485	92	NR	615	900	NR	745	24	NR	875	1	NR			

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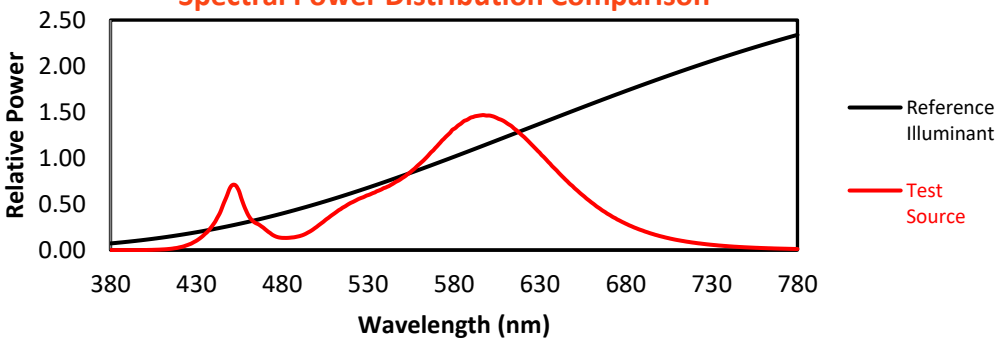
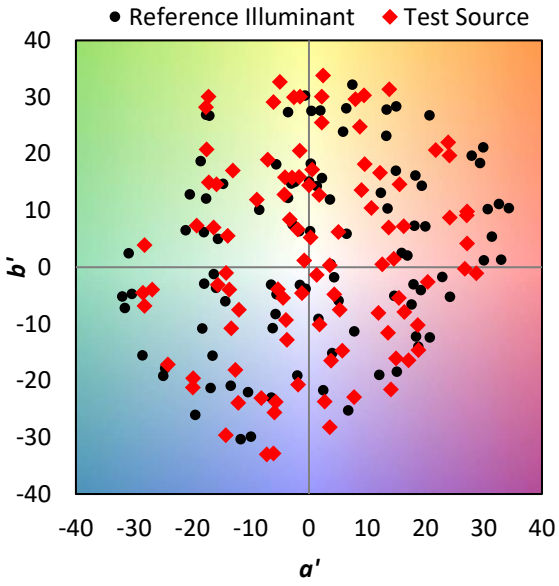
Summary

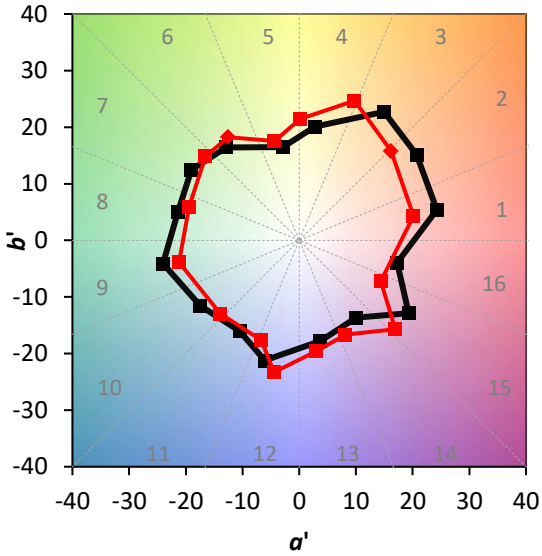
R_f = 75.5
R_g = 93.6
CIE R_a = 71.7
R_9 = -35.3

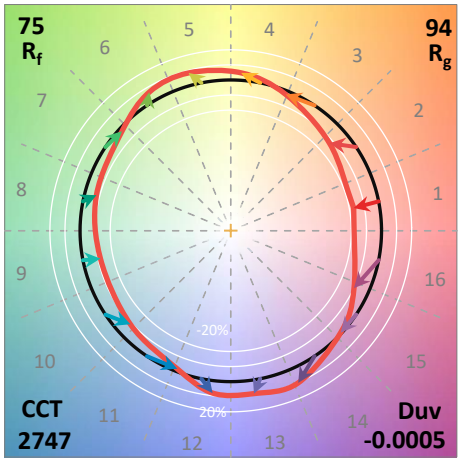
Spectral Power Distribution Comparison

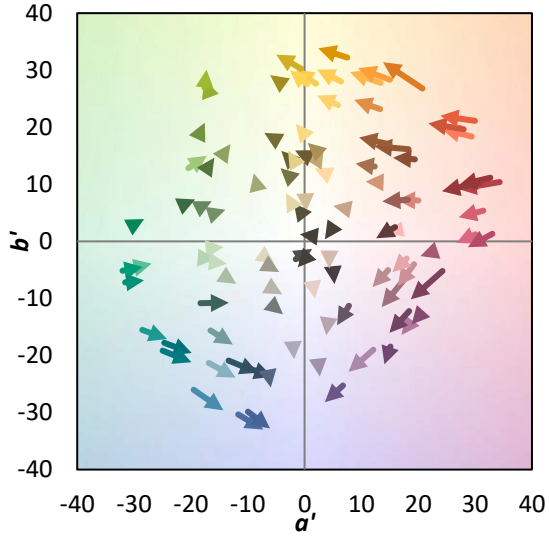


Color Vector Graphics









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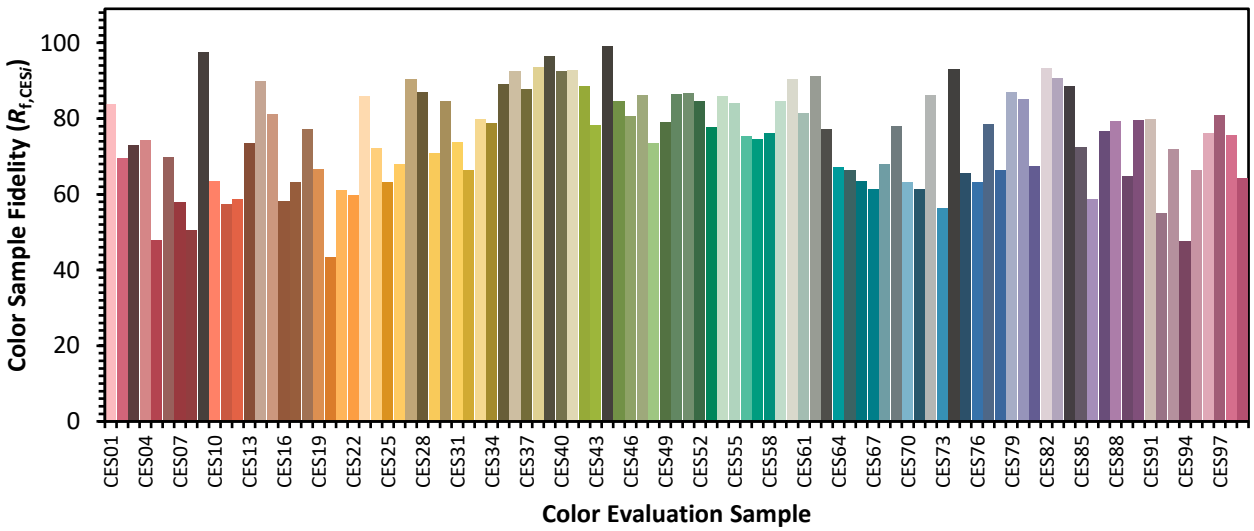
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 68	CES51 = 87	CES76 = 63
CES02 = 63	CES27 = 90	CES52 = 85	CES77 = 79
CES03 = 31	CES28 = 87	CES53 = 78	CES78 = 66
CES04 = 71	CES29 = 71	CES54 = 86	CES79 = 87
CES05 = 50	CES30 = 85	CES55 = 84	CES80 = 85
CES06 = 52	CES31 = 74	CES56 = 75	CES81 = 67
CES07 = 42	CES32 = 66	CES57 = 75	CES82 = 93
CES08 = 41	CES33 = 80	CES58 = 76	CES83 = 91
CES09 = 29	CES34 = 79	CES59 = 85	CES84 = 89
CES10 = 77	CES35 = 89	CES60 = 90	CES85 = 72
CES11 = 60	CES36 = 93	CES61 = 81	CES86 = 59
CES12 = 66	CES37 = 88	CES62 = 91	CES87 = 77
CES13 = 43	CES38 = 93	CES63 = 77	CES88 = 79
CES14 = 74	CES39 = 97	CES64 = 67	CES89 = 65
CES15 = 72	CES40 = 93	CES65 = 66	CES90 = 80
CES16 = 48	CES41 = 93	CES66 = 63	CES91 = 80
CES17 = 51	CES42 = 89	CES67 = 61	CES92 = 55
CES18 = 57	CES43 = 78	CES68 = 68	CES93 = 72
CES19 = 73	CES44 = 99	CES69 = 78	CES94 = 48
CES20 = 67	CES45 = 85	CES70 = 63	CES95 = 66
CES21 = 88	CES46 = 81	CES71 = 61	CES96 = 76
CES22 = 80	CES47 = 86	CES72 = 86	CES97 = 81
CES23 = 92	CES48 = 74	CES73 = 56	CES98 = 76
CES24 = 91	CES49 = 79	CES74 = 93	CES99 = 64
CES25 = 73	CES50 = 86	CES75 = 66	



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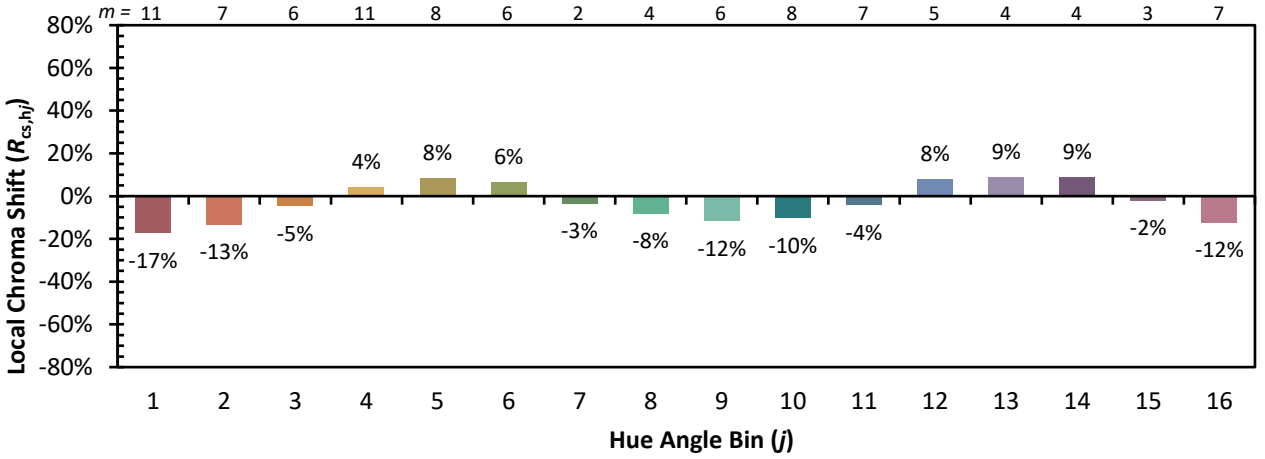
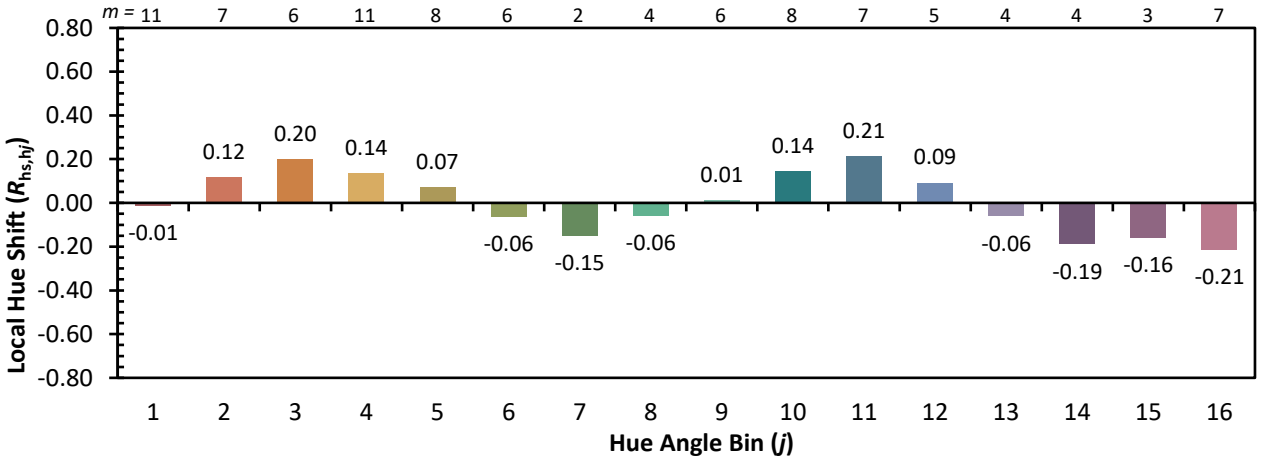
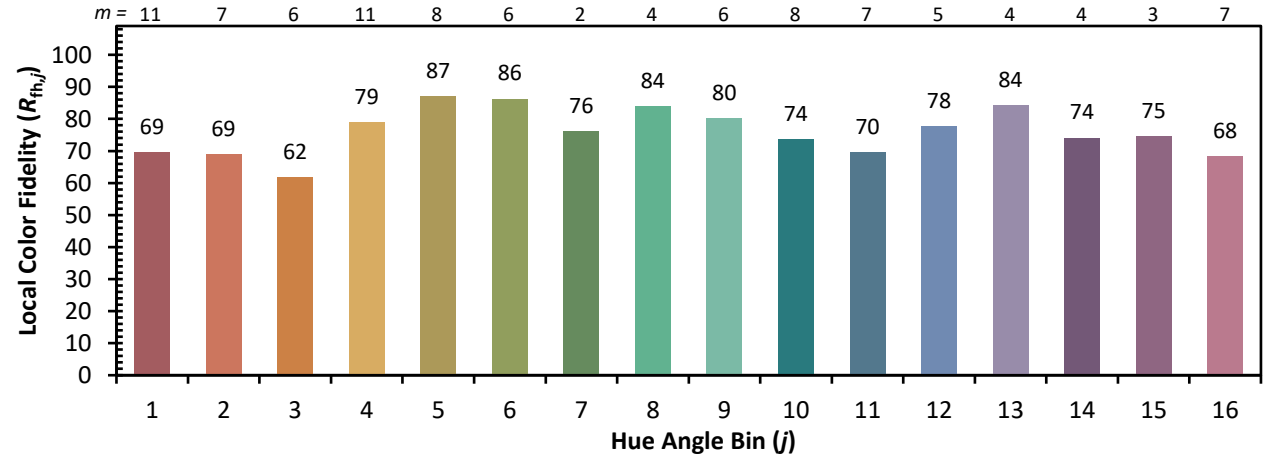
Color Rendition by Hue-Angle Bin







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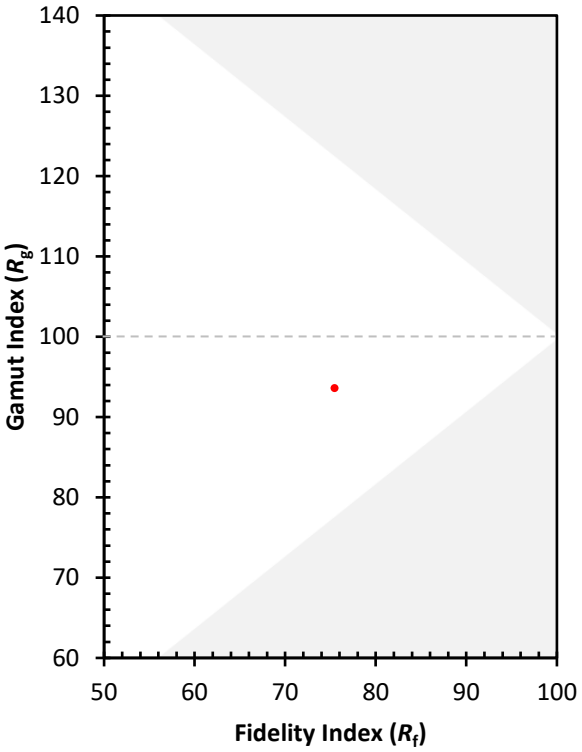
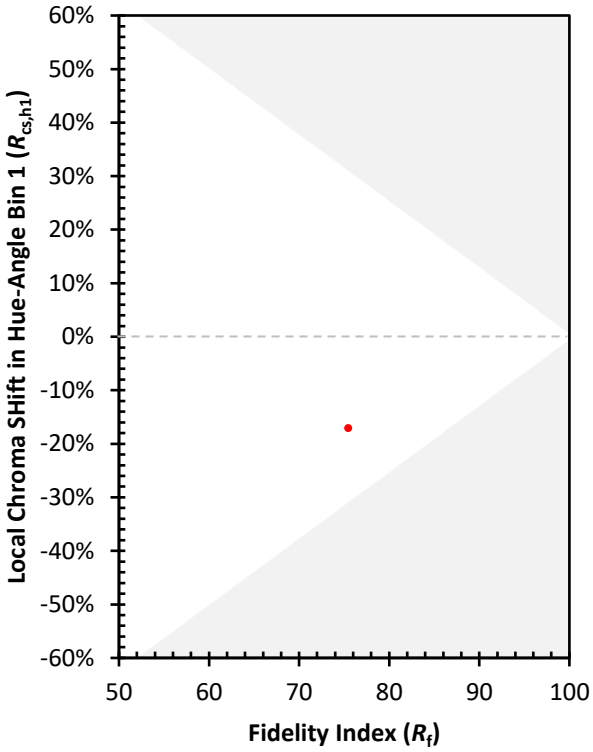
Measure Comparisons





(END OF REPORT)