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: P869082

Luminaire Tested: **EMM2-HSN-SA1A-727-U-T5R**

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:	P869082
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	08/22/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HSN-SA1A-727-U-T5R
Description:	EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 40W 70CRI 2700K FIXTURE w/ TYPE V ROUND DISTRIBUTION OPTIC
Light Source:	(10) 2700K CCT, 70 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	4686.2 lumens
Efficiency:	N/A
Efficacy:	142.9 lumens/watt
Luminous Opening:	Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B3 - U0 - G1

Input Watts (W):	32.8
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.99
Total Harmonic Distortion (THDi):	9.76%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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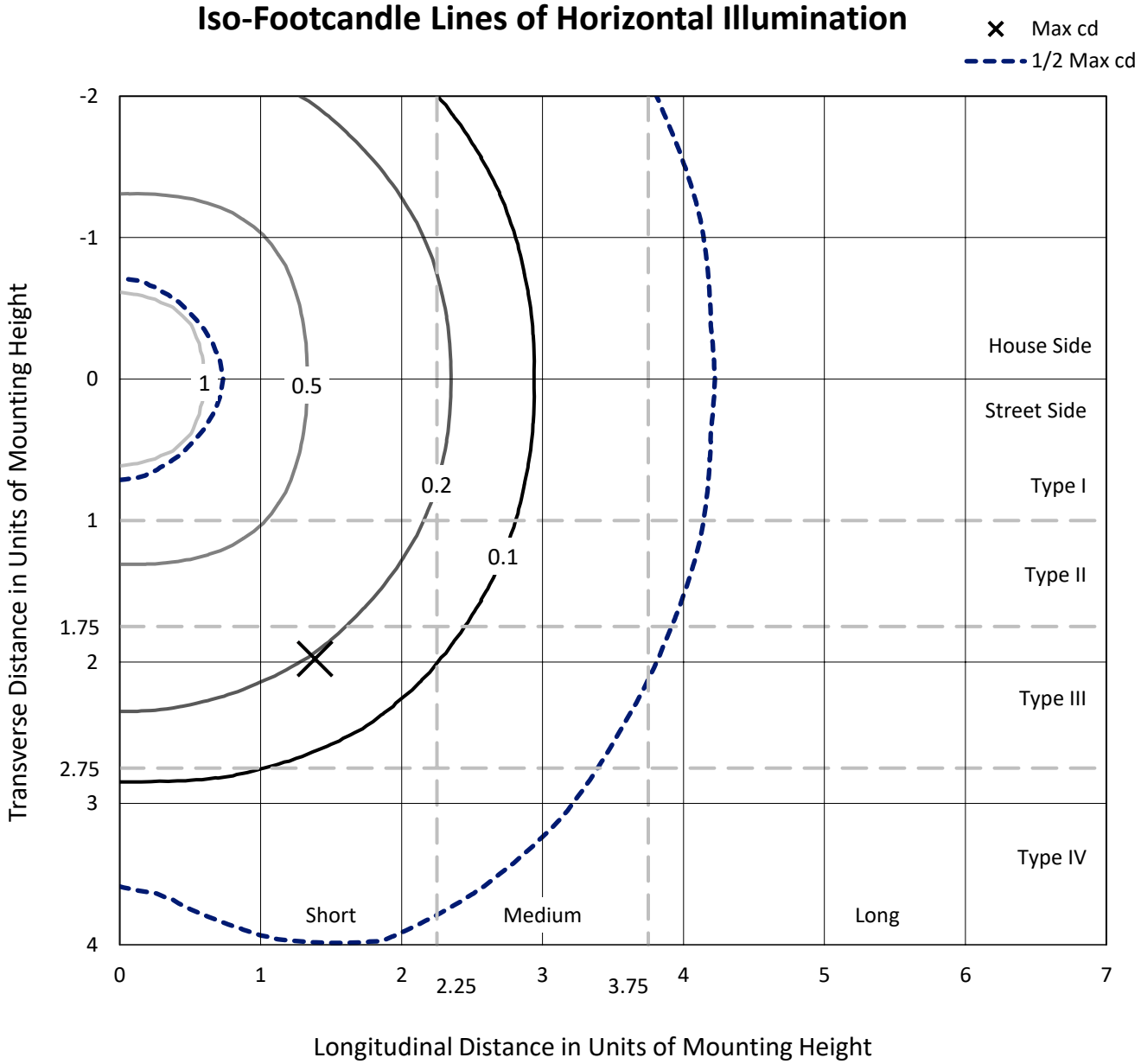
Scaled Data Report

REPORT NUMBER: P869082
CATALOG NUMBER: EMM2-HSN-SA1A-727-U-T5R

Iso-Footcandle Lines of Horizontal Illumination



Based on 20 foot mounting height. Maximum calculated value = 1.1 fc
Type V - Short - N/A

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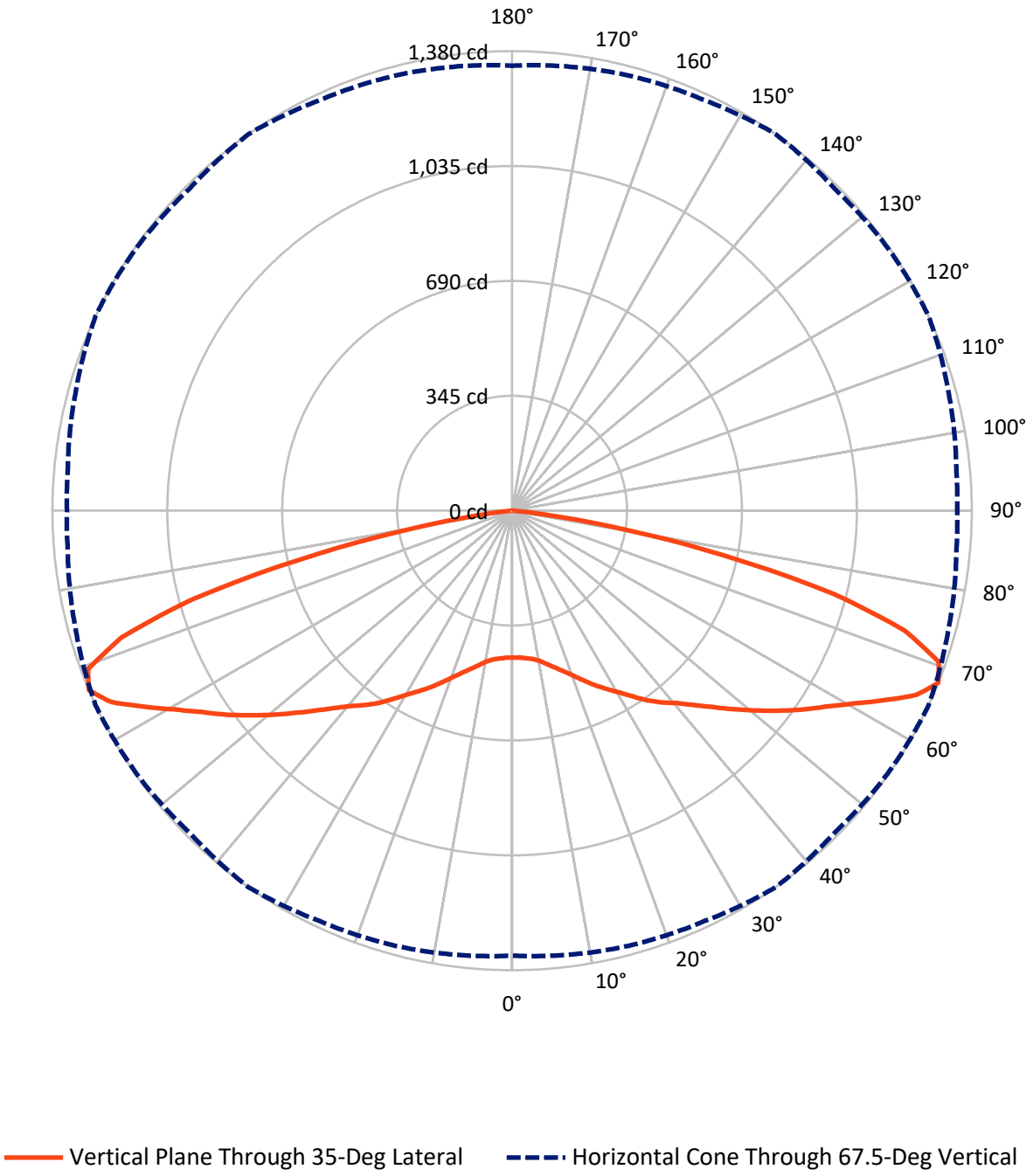
Luminous Intensity Polar Plot



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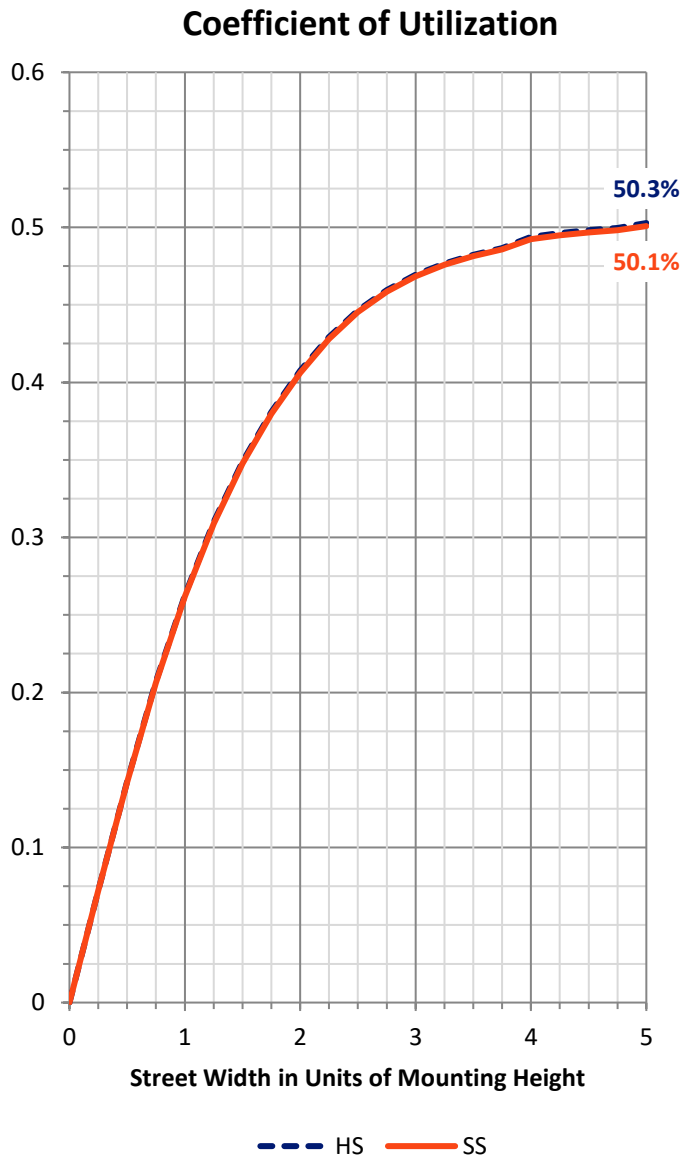
CATALOG NUMBER: EMM2-HSN-SA1A-727-U-T5R

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	2343.1	0.0	2343.1
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	2343.1	0.0	2343.1
	% Fixture	50.0	0.0	50.0
Total	Lumens	4686.2	0.0	4686.2
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	42.9	0.9
10°-20°	140.7	3.0
20°-30°	268.9	5.7
30°-40°	434.5	9.3
40°-50°	636.0	13.6
50°-60°	912.0	19.5
60°-70°	1278.3	27.3
70°-80°	901.9	19.2
80°-90°	71.0	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°	4686.2	100.0
0°-180°	4686.2	100.0



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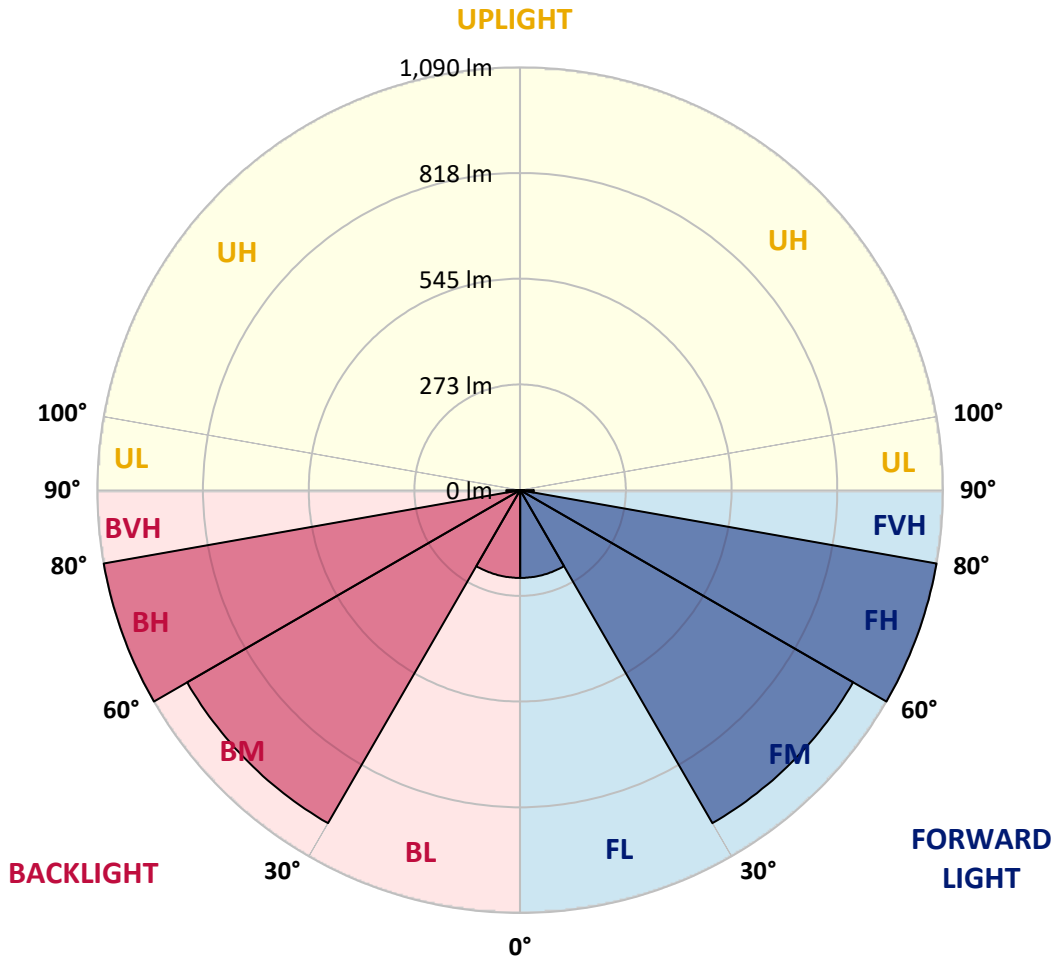
REPORT NUMBER: P869082
CATALOG NUMBER: EMM2-HSN-SA1A-727-U-T5R

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	226.3	4.8			
FM	(30°-60°)	991.3	21.2			
FH	(60°-80°)	1090.1	23.3			G1/1800
FVH	(80°-90°)	35.5	0.8			G1/100
BL	(0°-30°)	226.3	4.8	B1/500		
BM	(30°-60°)	991.3	21.2	B1/1000		
BH	(60°-80°)	1090.1	23.3	B3/2500		G1/1800
BVH	(80°-90°)	35.5	0.8			G1/100
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B3-U0-G1
Type V Short



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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	441.4	441.4	441.4	441.4	*441.4*	441.4	441.4	441.4	441.4	441.4	441.4
2.5°	444.2	443.3	442.3	442.3	*441.4*	442.3	441.4	442.3	441.4	441.4	441.4
5°	446.9	446.0	446.0	446.0	*445.1*	445.1	445.1	445.1	444.2	443.3	444.2
7.5°	449.6	449.6	448.7	450.6	*449.6*	450.6	450.6	451.5	449.6	448.7	449.6
10°	456.9	456.9	456.9	458.8	*458.8*	461.5	461.5	462.4	461.5	459.7	459.7
12.5°	472.4	471.5	471.5	471.5	*473.4*	475.2	477.0	477.0	476.1	473.4	473.4
15°	489.8	491.6	489.8	488.9	*489.8*	491.6	493.4	493.4	492.5	491.6	491.6
17.5°	510.7	511.7	509.8	508.0	*508.0*	510.7	511.7	511.7	510.7	508.9	508.9
20°	529.0	529.9	529.9	529.0	*529.9*	531.7	532.6	533.6	530.8	528.1	528.1
22.5°	544.5	545.4	547.2	550.9	*554.5*	556.4	555.4	555.4	550.9	548.1	547.2
25°	563.6	566.4	570.0	574.6	*581.0*	585.5	583.7	580.1	576.4	570.9	570.0
27.5°	601.0	601.0	597.4	599.2	*606.5*	611.1	609.3	606.5	599.2	595.6	594.7
30°	630.2	630.2	630.2	628.4	*633.0*	638.4	636.6	632.1	628.4	626.6	626.6
32.5°	658.5	656.7	659.4	663.1	*664.9*	666.7	666.7	663.1	656.7	653.9	653.9
35°	685.0	686.8	689.5	695.0	*699.5*	696.8	692.2	689.5	683.1	677.7	677.7
37.5°	710.5	712.3	715.0	723.3	*730.6*	729.6	724.2	716.9	708.7	704.1	701.4
40°	728.7	729.6	736.9	749.7	*759.7*	763.4	758.8	748.8	736.0	726.9	727.8
42.5°	750.6	752.4	764.3	782.5	*797.1*	802.6	796.2	782.5	764.3	752.4	752.4
45°	782.5	783.5	799.0	821.8	*840.9*	850.0	840.9	821.8	798.0	786.2	785.3
47.5°	814.5	817.2	834.5	861.9	*890.2*	901.1	891.1	866.5	838.2	823.6	821.8
50°	850.9	852.8	873.7	911.1	*943.1*	957.7	944.9	913.9	882.9	864.6	865.5
52.5°	886.5	892.0	920.3	959.5	*997.8*	1014.2	996.0	962.2	929.4	912.1	911.1
55°	939.4	945.8	970.4	1014.2	*1054.3*	1072.6	1055.2	1017.9	982.3	963.1	959.5
57.5°	1006.0	1009.6	1031.5	1076.2	*1110.0*	1127.3	1117.3	1082.6	1048.9	1025.1	1020.6
60°	1081.7	1085.3	1102.7	1148.3	*1175.6*	1188.4	1184.8	1164.7	1141.9	1130.9	1128.2
62.5°	1189.3	1190.2	1199.3	1225.8	*1253.2*	1258.6	1249.5	1245.0	1252.2	1240.4	1243.1
65°	1312.4	1312.4	1309.7	1313.4	*1334.3*	1327.9	1321.6	1341.6	1338.0	1317.9	1314.3
67.5°	*1336.2*	*1341.6*	*1352.6*	*1360.8*	*1379.9*	*1368.1*	*1376.3*	*1379.9*	*1357.1*	*1338.9*	*1336.2*
70°	1195.7	1202.1	1263.2	1300.6	*1359.0*	1369.9	1343.5	1329.8	1304.2	1270.5	1261.4
72.5°	815.4	847.3	1023.3	1143.7	*1233.1*	1246.8	1232.2	1214.9	1163.8	1137.3	1119.1
75°	651.2	668.5	825.4	944.0	*996.9*	996.0	937.6	918.4	878.3	874.7	878.3
77.5°	397.7	401.3	555.4	648.5	*654.9*	651.2	627.5	612.9	618.4	591.0	595.6
80°	121.3	132.2	209.8	316.5	*340.2*	329.3	324.7	330.2	335.6	343.8	356.6
82.5°	24.6	31.0	42.0	91.2	*104.0*	103.1	102.1	113.1	123.1	127.7	155.0
85°	2.7	2.7	3.6	7.3	*15.5*	24.6	25.5	22.8	34.7	33.7	23.7
87.5°	0.9	0.9	0.9	0.9	*0.9*	1.8	1.8	1.8	1.8	1.8	1.8
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

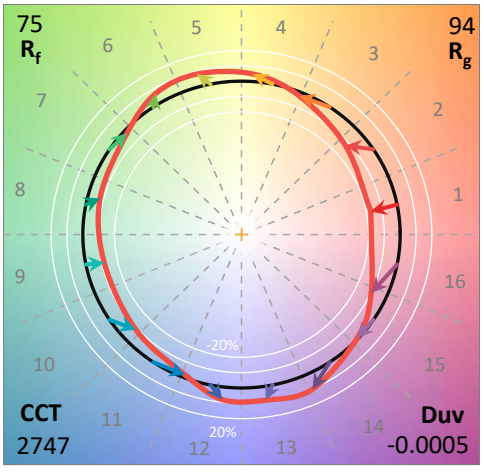
Test Information

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

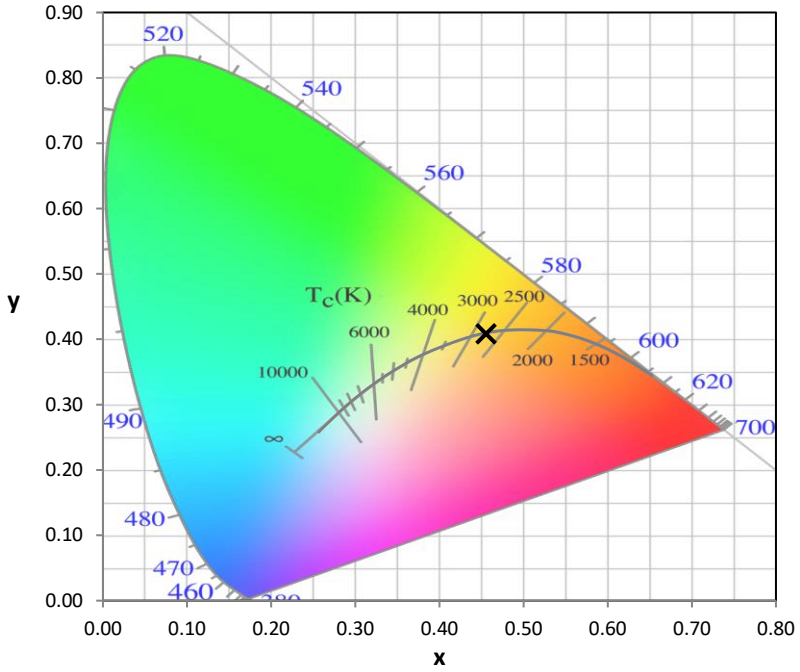
Stabilization Time:	22M
Operation Time:	1H 22M
Sphere Temperature (°C):	24.2

REPORT NUMBER: SP1-2407-157-3

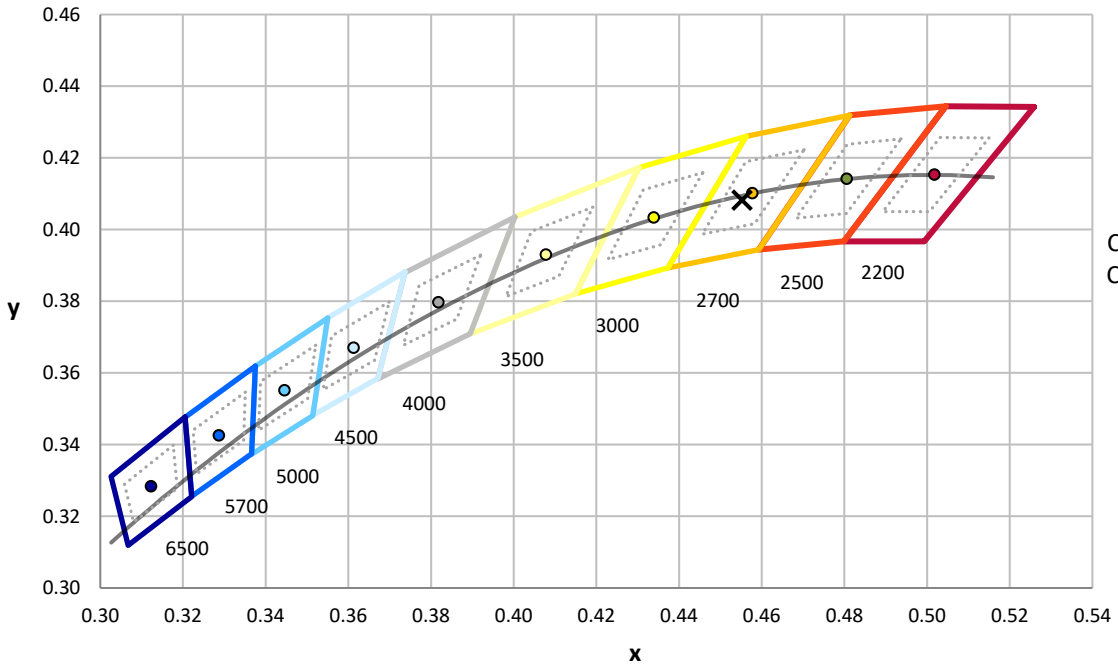
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085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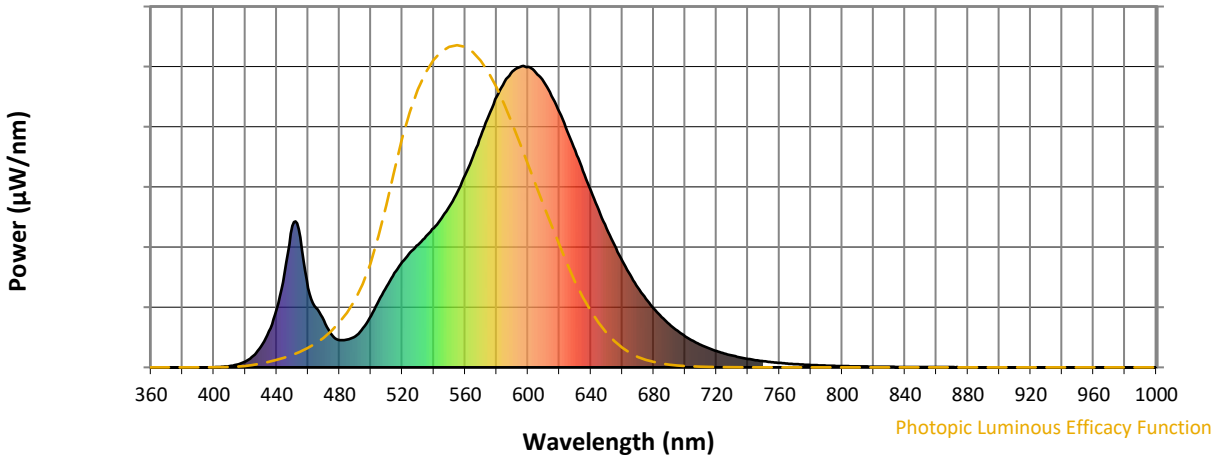
Photopic Flux vs. Wavelength

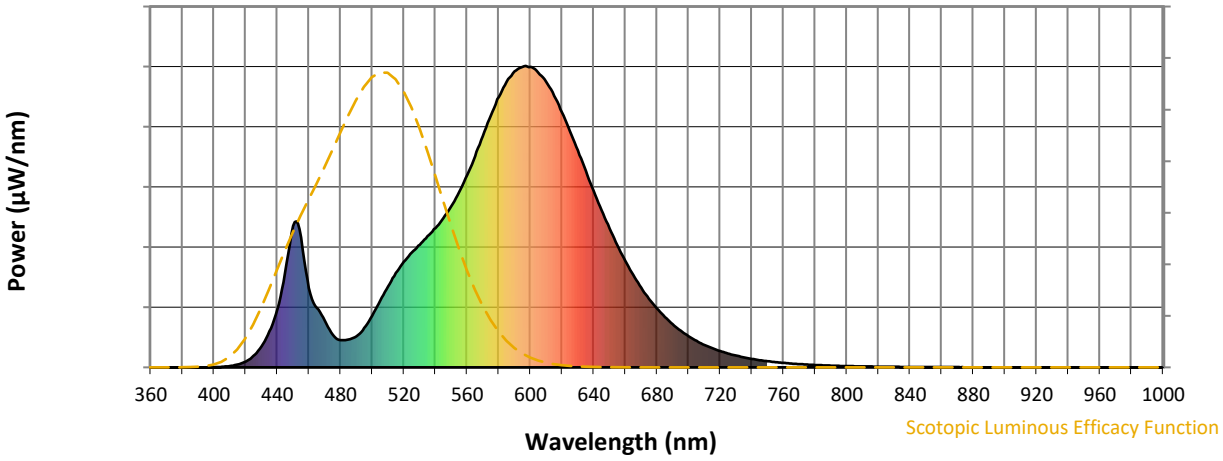


Photopic Lumens: NR

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

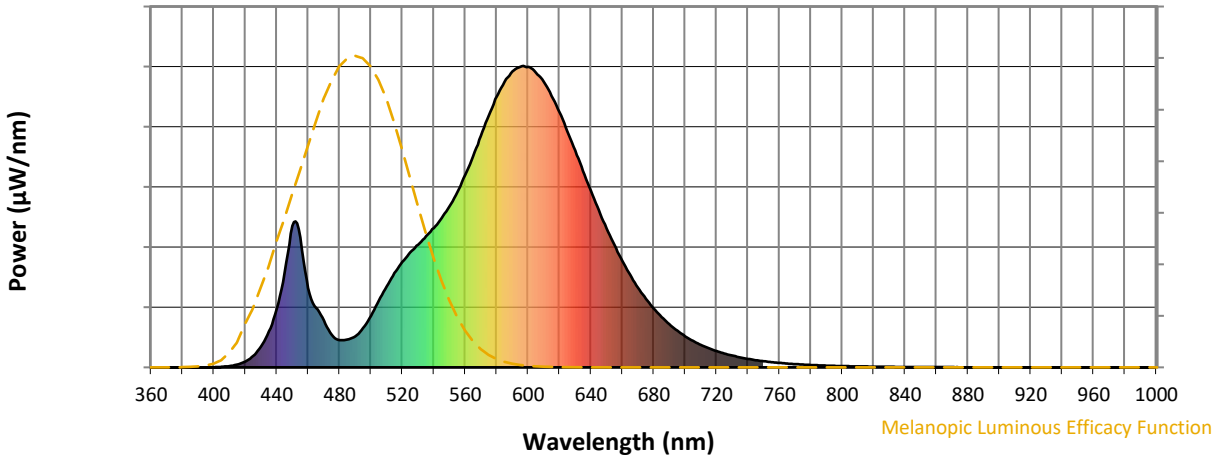


Scotopic Lumens: NR **S/P: 1.13**

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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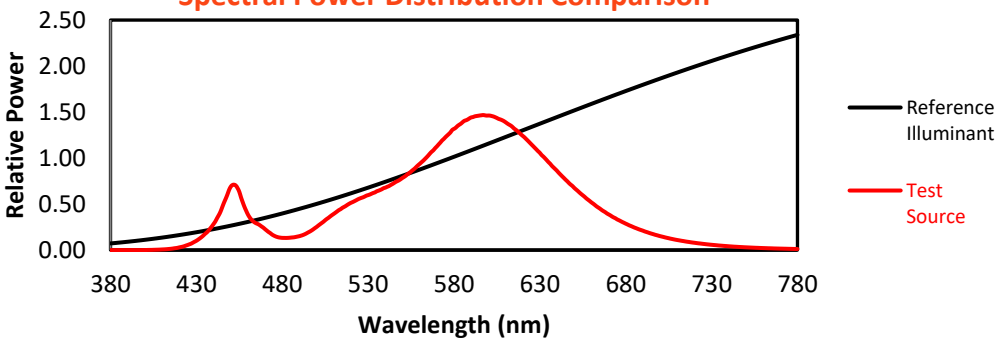
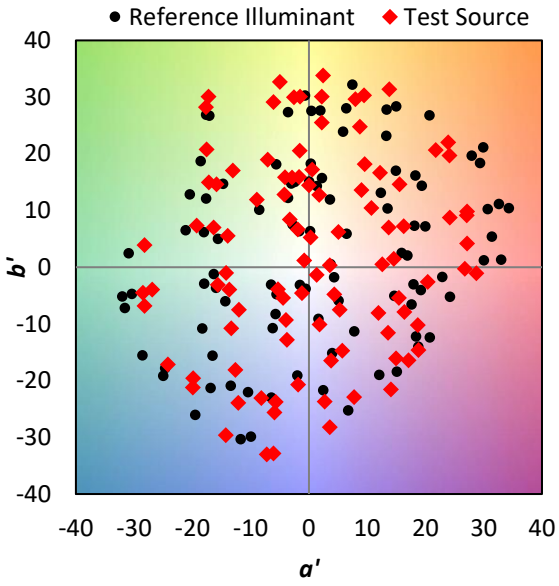
Summary

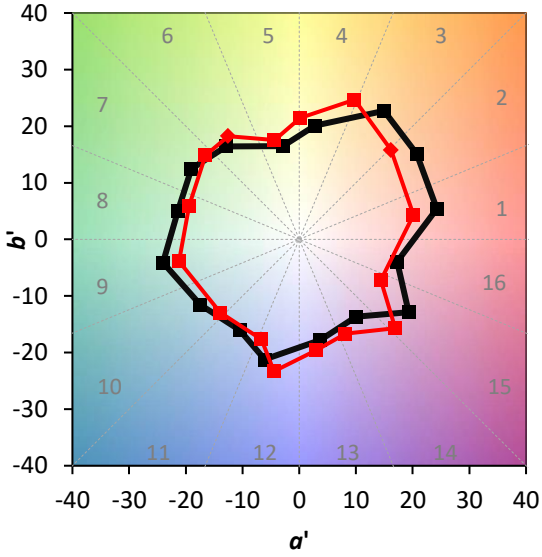
R_f = 75.5
R_g = 93.6
CIE R_a = 71.7
R_9 = -35.3

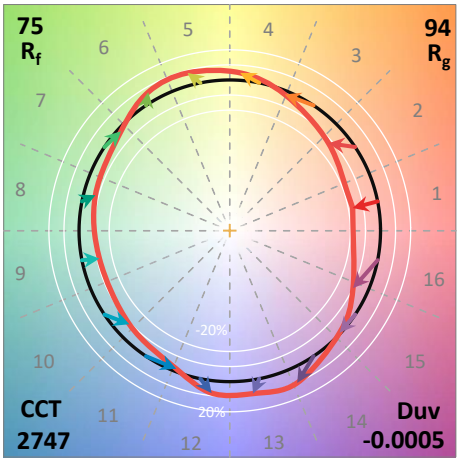
Spectral Power Distribution Comparison

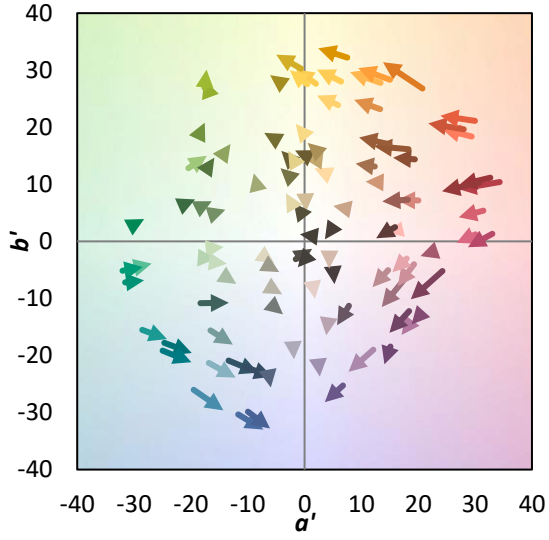


Color Vector Graphics









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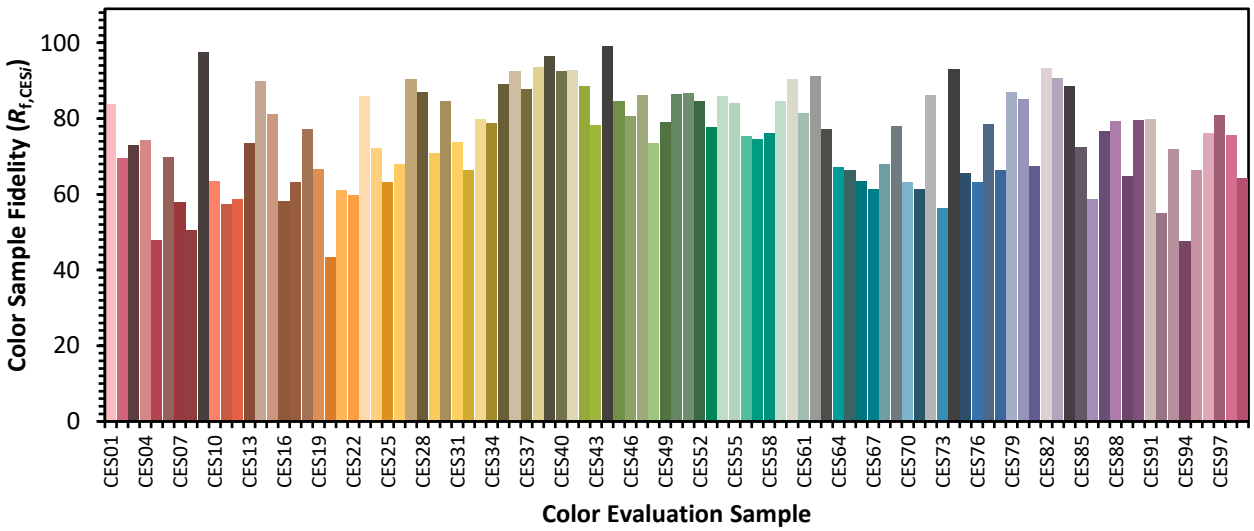
Individual Sample Fidelity Index ($R_{f,i}$)

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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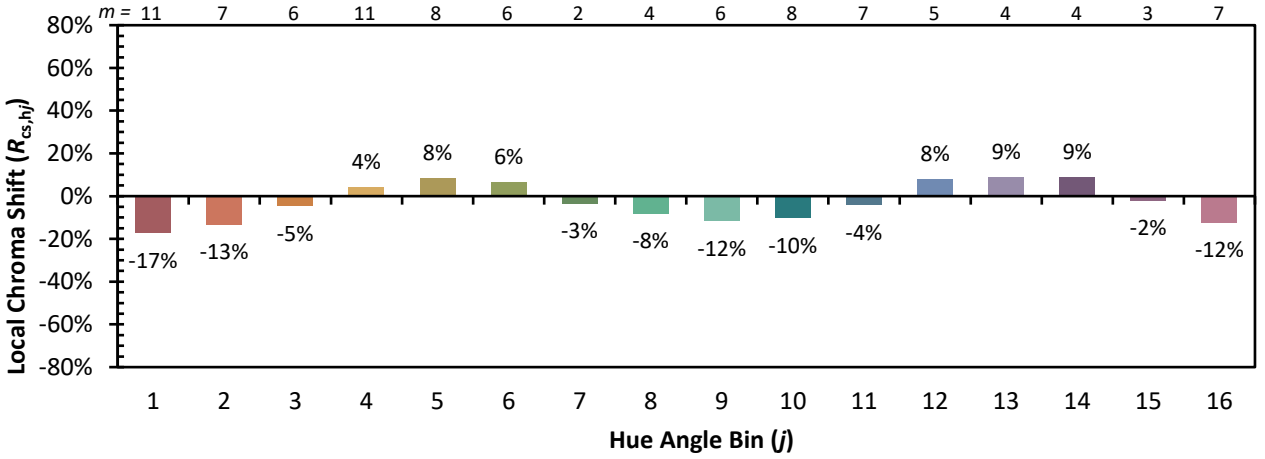
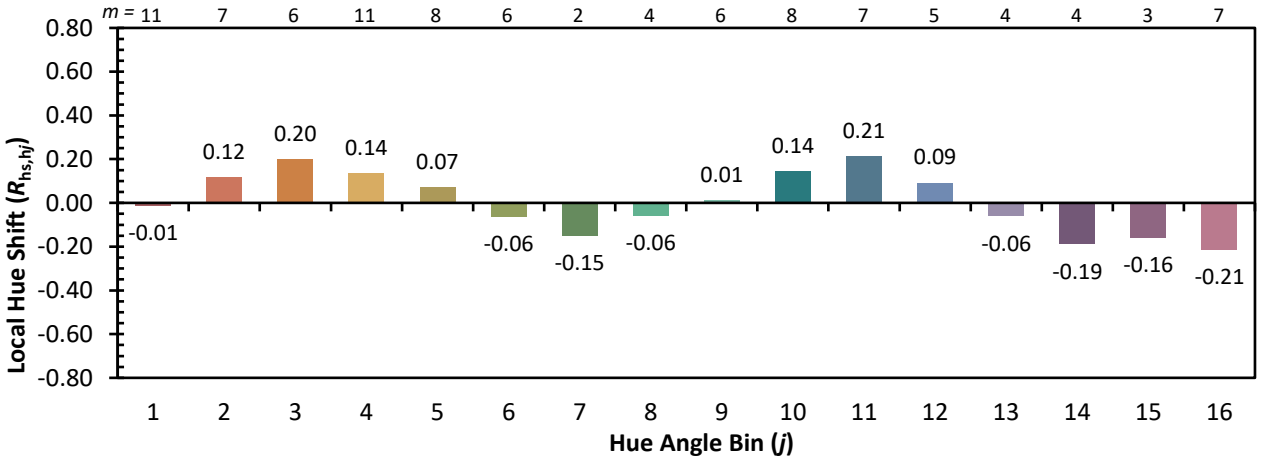
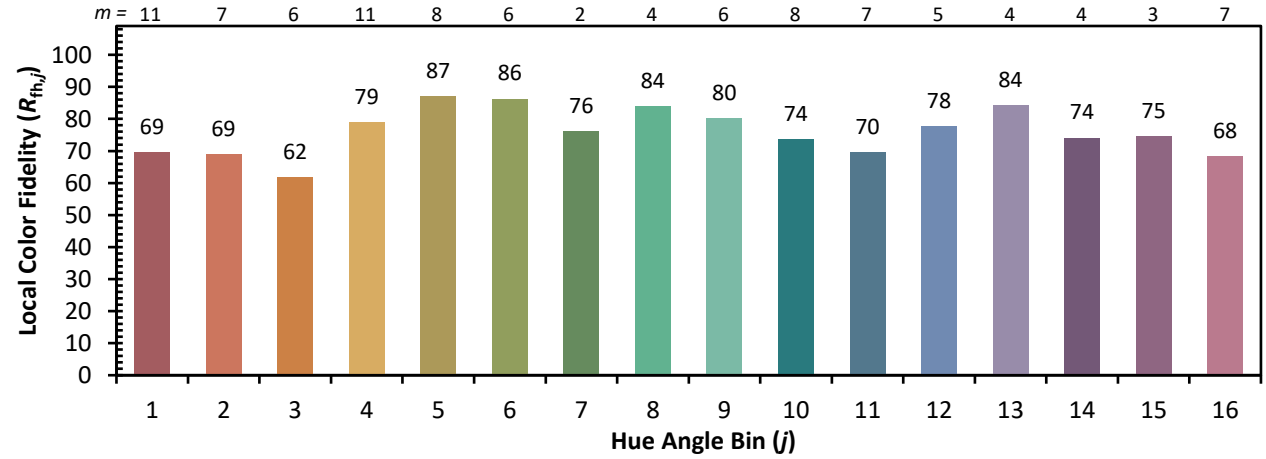
Color Rendition by Hue-Angle Bin







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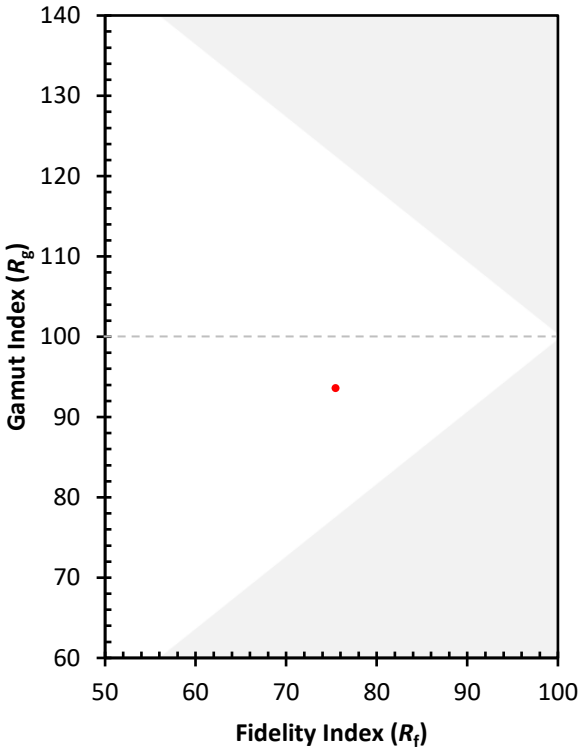
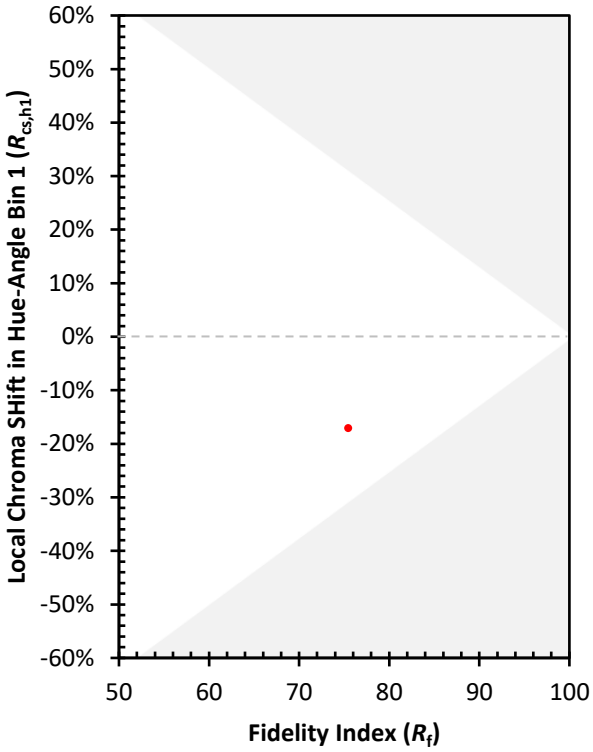
Measure Comparisons





(END OF REPORT)