Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled data based on original data using

LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: INVUE

Report Number: P871359

Luminaire Tested: EMM2-HSN-SA2B-840-U-5MQ

Issue Date: 09/05/2024

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

Test Information

Test Method:	LM-79-2024
Report Number:	P871359
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	5/19/2026
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	INVUE
Catalog Number:	EMM2-HSN-SA2B-840-U-5MQ
Description:	EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 80CRI 4000K FIXTURE w/ TYPE V SQUARE MEDIUM DISTRIBUTION OPTIC
Light Source:	(20) 4000K CCT, 80 CRI LEDS
Ballast/Driver:	-

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	12654.9 lumens
Efficiency:	N/A
Efficacy:	140.6 lumens/watt
Luminous Opening:	Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B3 - 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:	28.75 FT

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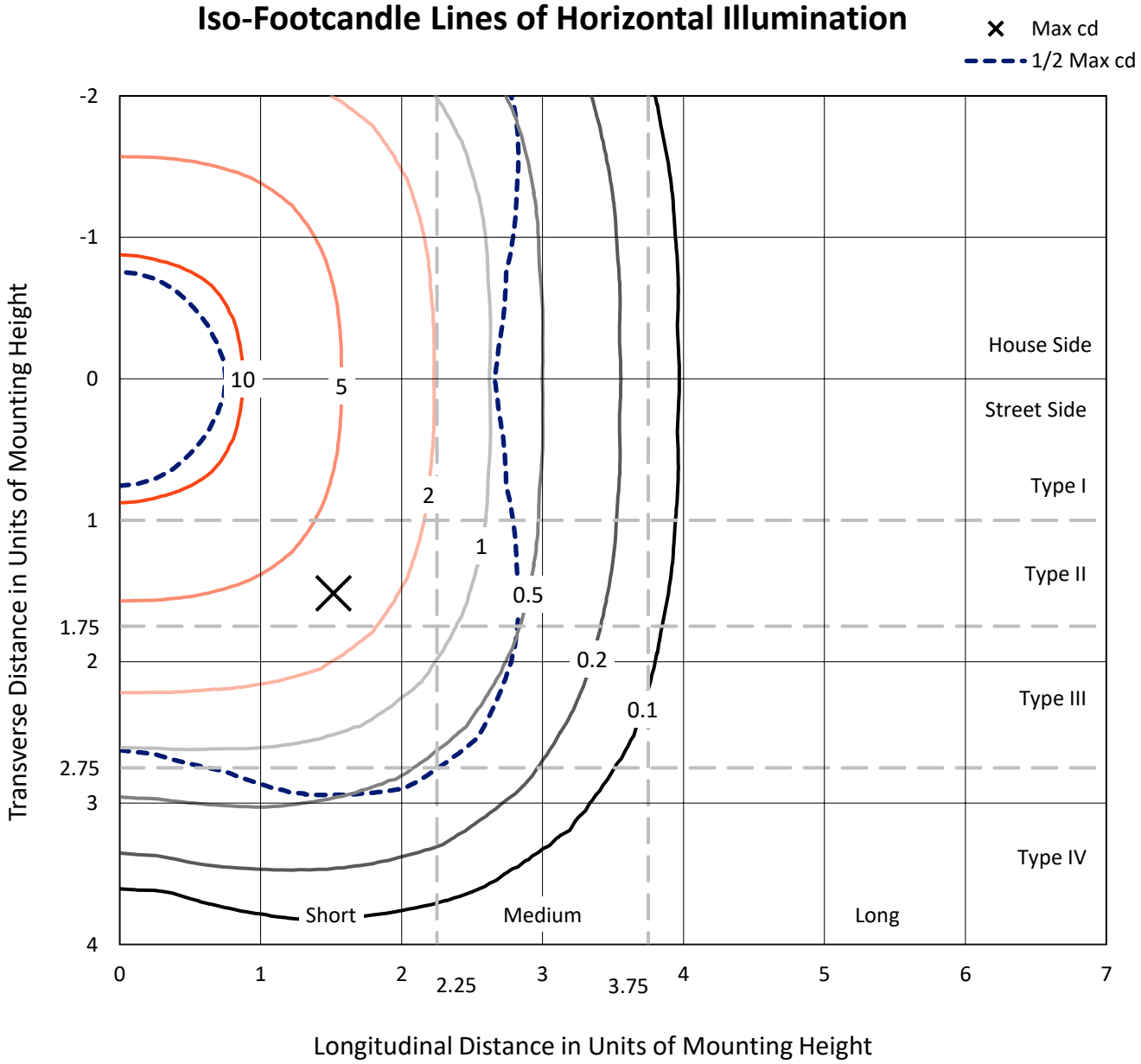
Iso-Footcandle Lines of Horizontal Illumination



Based on 10 foot mounting height. Maximum calculated value = 15.7 fc
Type V - Short - N/A

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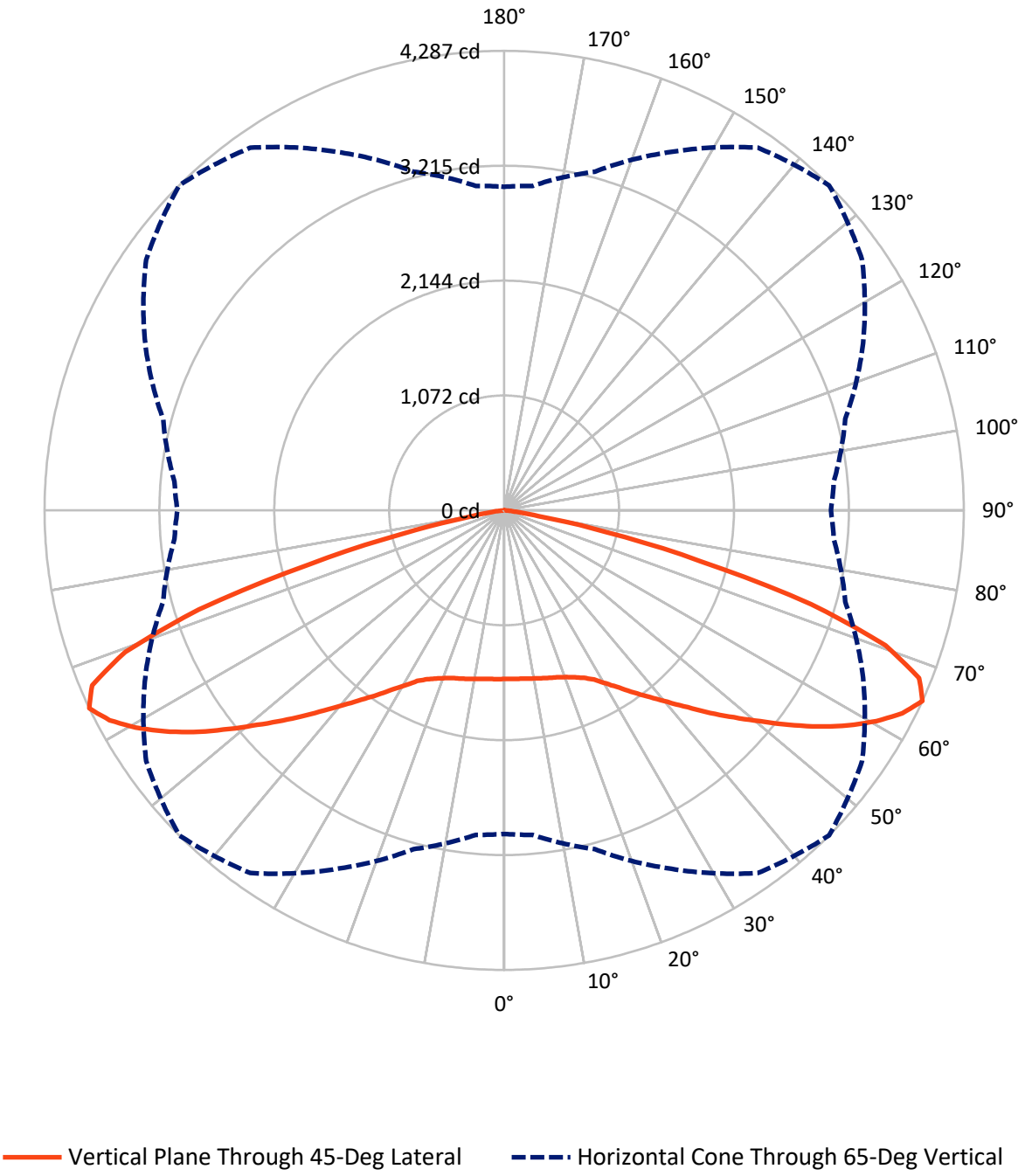
Luminous Intensity Polar Plot



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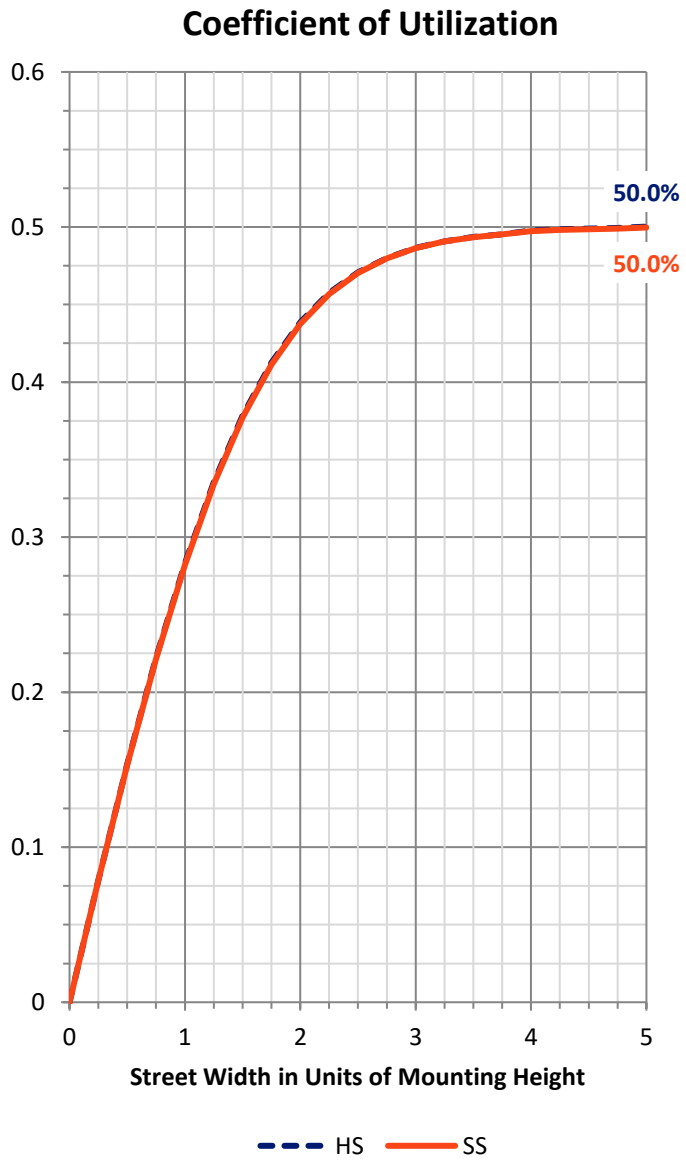
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	6327.4	0.0	6327.4
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	6327.4	0.0	6327.4
	% Fixture	50.0	0.0	50.0
Total	Lumens	12654.9	0.0	12654.9
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	151.2	1.2
10°-20°	460.2	3.6
20°-30°	809.5	6.4
30°-40°	1309.2	10.3
40°-50°	2039.3	16.1
50°-60°	2982.0	23.6
60°-70°	3433.9	27.1
70°-80°	1402.4	11.1
80°-90°	67.1	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°	12654.9	100.0
0°-180°	12654.9	100.0



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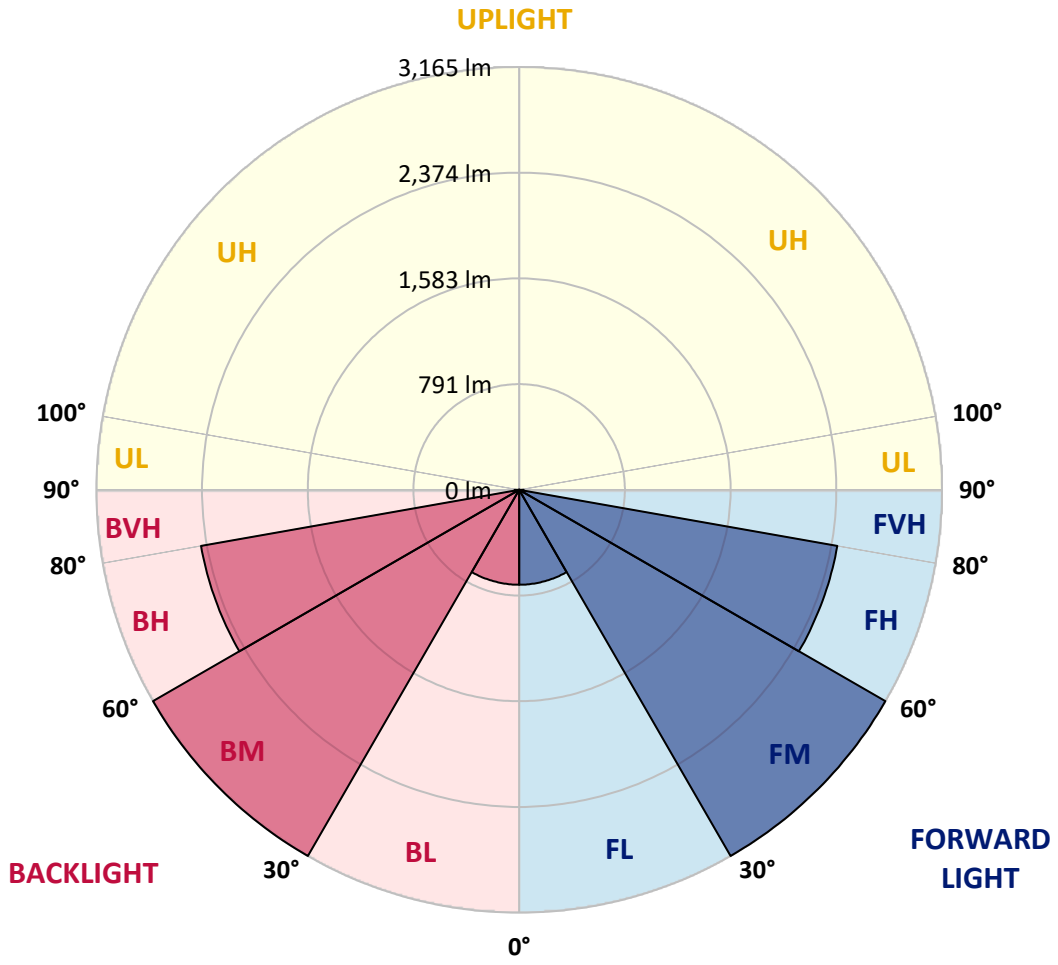
REPORT NUMBER: P871359
CATALOG NUMBER: EMM2-HSN-SA2B-840-U-5MQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	710.5	5.6			
FM	(30°-60°)	3165.3	25.0			
FH	(60°-80°)	2418.2	19.1			G2/5000
FVH	(80°-90°)	33.5	0.3			G1/100
BL	(0°-30°)	710.5	5.6	B2/1000		
BM	(30°-60°)	3165.3	25.0	B3/5000		
BH	(60°-80°)	2418.2	19.1	B3/2500		G2/5000
BVH	(80°-90°)	33.5	0.3			G1/100
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B3-U0-G2
Type V Short



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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1572.4	1572.4	1572.4	1572.4	1572.4	1572.4	1572.4	1572.4	1572.4	1572.4	1572.4
2.5°	1577.3	1577.3	1574.9	1574.9	1570.0	1574.9	1572.4	1574.9	1572.4	1572.4	1574.9
5°	1582.2	1582.2	1577.3	1579.7	1574.9	1577.3	1574.9	1579.7	1577.3	1574.9	1579.7
7.5°	1589.5	1589.5	1584.6	1587.0	1582.2	1584.6	1582.2	1587.0	1584.6	1584.6	1587.0
10°	1596.7	1599.2	1594.3	1591.9	1591.9	1594.3	1596.7	1599.2	1596.7	1596.7	1601.6
12.5°	1608.9	1611.3	1606.5	1604.0	1604.0	1606.5	1608.9	1613.8	1606.5	1606.5	1606.5
15°	1621.0	1621.0	1618.6	1616.2	1618.6	1621.0	1621.0	1625.9	1621.0	1616.2	1616.2
17.5°	1625.9	1628.3	1625.9	1630.8	1633.2	1635.6	1638.1	1638.1	1630.8	1628.3	1628.3
20°	1642.9	1645.3	1640.5	1642.9	1650.2	1659.9	1659.9	1659.9	1659.9	1652.6	1652.6
22.5°	1672.1	1674.5	1672.1	1672.1	1681.8	1691.5	1691.5	1698.8	1689.1	1684.2	1684.2
25°	1720.7	1720.7	1718.3	1720.7	1725.6	1730.4	1740.1	1745.0	1745.0	1742.6	1745.0
27.5°	1779.0	1781.4	1779.0	1779.0	1776.6	1786.3	1800.9	1808.2	1810.6	1813.0	1813.0
30°	1856.8	1861.7	1859.2	1861.7	1866.5	1873.8	1878.7	1881.1	1881.1	1876.2	1876.2
32.5°	1941.9	1946.7	1941.9	1954.0	1971.0	1971.0	1966.2	1975.9	1968.6	1963.7	1958.9
35°	2041.5	2041.5	2046.4	2051.2	2075.5	2087.7	2087.7	2082.8	2068.2	2060.9	2065.8
37.5°	2155.7	2158.2	2163.0	2165.4	2187.3	2209.2	2206.8	2194.6	2177.6	2158.2	2158.2
40°	2291.8	2287.0	2289.4	2306.4	2323.4	2350.2	2352.6	2335.6	2306.4	2287.0	2287.0
42.5°	2415.8	2418.2	2427.9	2449.8	2488.7	2510.6	2498.4	2469.2	2437.6	2413.3	2410.9
45°	2547.0	2544.6	2571.3	2617.5	2668.5	2695.3	2675.8	2634.5	2585.9	2554.3	2554.3
47.5°	2680.7	2678.2	2722.0	2797.3	2863.0	2884.8	2865.4	2811.9	2746.3	2700.1	2692.8
50°	2819.2	2828.9	2875.1	2982.0	3067.1	3091.4	3067.1	2996.6	2909.1	2848.4	2838.7
52.5°	2977.2	2984.5	3045.2	3161.9	3266.4	3322.3	3285.8	3181.3	3069.5	2996.6	2986.9
55°	3123.0	3127.9	3215.4	3356.3	3485.1	3560.5	3502.1	3368.5	3227.5	3135.2	3125.4
57.5°	3225.1	3237.2	3349.0	3531.3	3696.6	3784.1	3696.6	3553.2	3366.0	3251.8	3244.5
60°	3290.7	3310.1	3439.0	3667.4	3895.9	3990.6	3900.7	3701.4	3470.5	3322.3	3315.0
62.5°	3256.7	3283.4	3448.7	3747.6	4066.0	4168.1	4051.4	3771.9	3458.4	3271.3	3251.8
65°	3018.5	3037.9	3271.3	3689.3	4129.2	4287.1	4075.7	3694.1	3293.1	3086.5	3047.7
67.5°	2525.1	2559.2	2867.8	3407.4	3993.1	4175.3	3908.0	3414.6	2931.0	2678.2	2634.5
70°	1939.4	2000.2	2338.0	2923.7	3567.8	3774.3	3480.3	2882.4	2313.7	2056.1	1975.9
72.5°	1120.4	1215.2	1711.0	2282.1	2838.7	2994.2	2581.0	2014.8	1536.0	1353.7	1331.8
75°	371.8	405.9	814.2	1314.8	1810.6	1888.4	1613.8	1271.1	1011.0	865.2	872.5
77.5°	182.3	182.3	245.5	481.2	823.9	972.1	882.2	614.9	442.3	335.4	325.7
80°	145.8	145.8	170.1	235.7	277.1	325.7	277.1	201.7	165.3	150.7	158.0
82.5°	70.5	68.0	80.2	114.2	116.7	111.8	104.5	104.5	99.6	92.4	89.9
85°	4.9	4.9	9.7	21.9	36.5	48.6	55.9	53.5	51.0	43.7	48.6
87.5°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	4.9	4.9	4.9	4.9
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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Version: v6.12

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Test Information

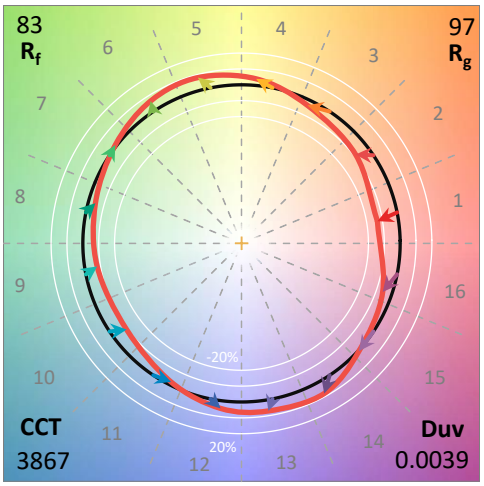
Test Method:	LM-79-2019
Report Number:	SP1-2309-178-2
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	09/22/2023
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	McGRAW-EDISON
Catalog Number:	**GALN-SA2A-840-U-T4W**
Description:	GALLEON 2 AREA AND ROADWAY LUMINAIRE. (2) 80 CRI, 4000K, 615MA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS

LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS

Spectral Parameters

CCT (K):	3867	CRI (Ra):	79.8		
CIE u':	0.2254	R1:	76.6	R9:	-8.6
CIE v':	0.5090	R2:	84.7	R10:	66.3
Duv:	0.0039	R3:	93.7	R11:	80.5
CIE x:	0.3895	R4:	80.6	R12:	67.3
CIE y:	0.3908	R5:	77.9	R13:	77.9
CIE z:	0.2197	R6:	81.2	R14:	96.6
Peak Wavelength (nm):	593	R7:	84.2		
Dominant Wavelength (nm):	577	R8:	59.0		
Purity:	34.3				

Rf:	82.7
Rg:	96.5



Test Conditions

Stabilization Time:	25M
Operation Time:	12H
Room Temperature (°C) / RH%:	24.8/46%
Sphere Temperature (°C):	24.7

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Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	8/9/2023	2/9/2024
Power Meter	XITRON 2801 IN0071	11/29/2022	11/29/2023
AC Power Source	CHROMA 61603 IN0063	11/28/2022	11/28/2023
DC Power Source	AGILENT E3634A IN0208	11/28/2022	11/28/2023
Sphere Thermometer	ONSET IN0085	11/28/2022	11/28/2023
Room Thermometer	ONSET IN0046	11/28/2022	11/28/2023

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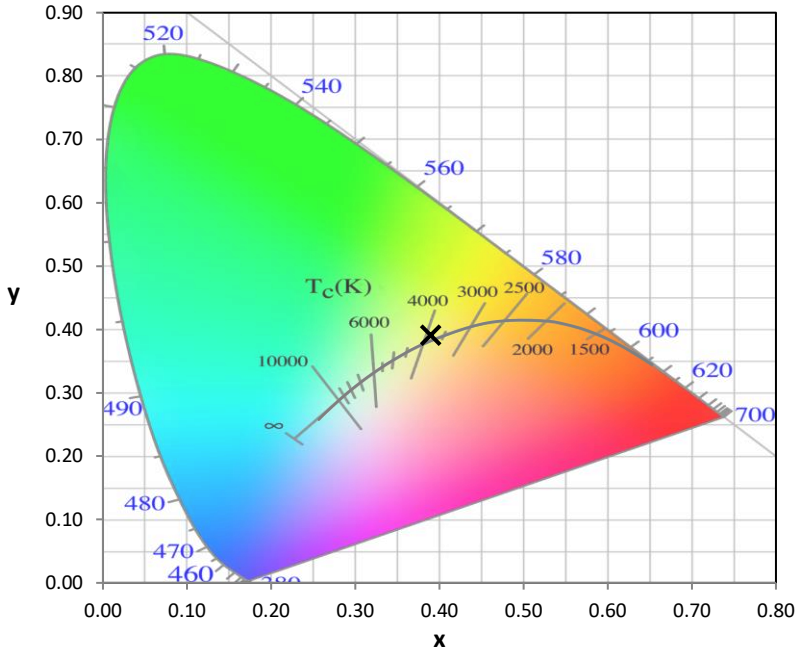
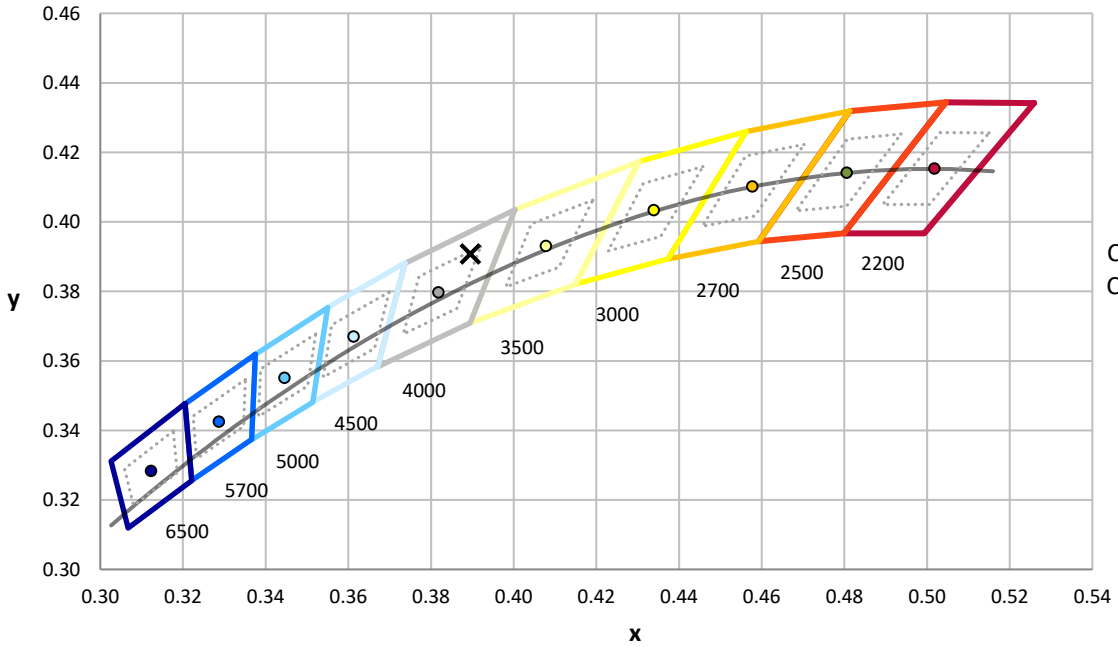
CIE 1931 Chromaticity Diagram



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



CCT = 3867K
CIE x = 0.3895
CIE y = 0.3908
Duv = 0.0039

Point lies inside the ANSI 4000K 4-step quadrangle

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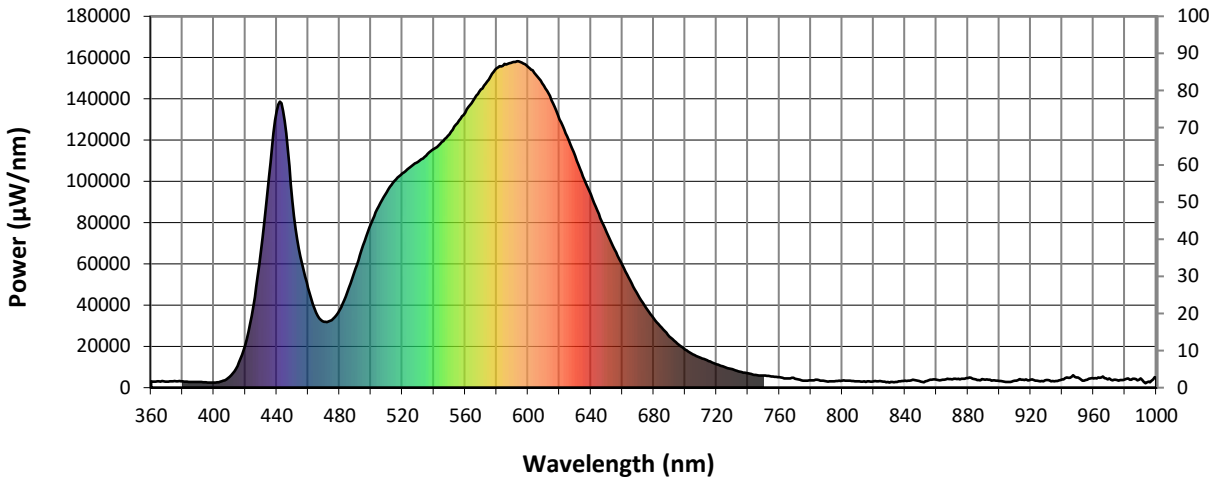
Photopic Flux vs. Wavelength



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λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)
360	3123	NR	490	57459	NR	620	129941	NR	750	5858	NR	880	4622	NR
365	3041	NR	495	69038	NR	625	121678	NR	755	5395	NR	885	3949	NR
370	2965	NR	500	79493	NR	630	112252	NR	760	5011	NR	890	4035	NR
375	3195	NR	505	87950	NR	635	102369	NR	765	4514	NR	895	3391	NR
380	3028	NR	510	94704	NR	640	93616	NR	770	4375	NR	900	3268	NR
385	2738	NR	515	100214	NR	645	84211	NR	775	3450	NR	905	2767	NR
390	2690	NR	520	103961	NR	650	75380	NR	780	3547	NR	910	3391	NR
395	2604	NR	525	106854	NR	655	66946	NR	785	3648	NR	915	3784	NR
400	2384	NR	530	109533	NR	660	59483	NR	790	3081	NR	920	3790	NR
405	3031	NR	535	112417	NR	665	51858	NR	795	3104	NR	925	3175	NR
410	5239	NR	540	115725	NR	670	44882	NR	800	3444	NR	930	3642	NR
415	10499	NR	545	119091	NR	675	38742	NR	805	3315	NR	935	3040	NR
420	20790	NR	550	122884	NR	680	33597	NR	810	3022	NR	940	4039	NR
425	39276	NR	555	128300	NR	685	29101	NR	815	2832	NR	945	4797	NR
430	66418	NR	560	133274	NR	690	24855	NR	820	3142	NR	950	4945	NR
435	101961	NR	565	139112	NR	695	21367	NR	825	3115	NR	955	3757	NR
440	134023	NR	570	144467	NR	700	18479	NR	830	2520	NR	960	4539	NR
445	129385	NR	575	149331	NR	705	16131	NR	835	2783	NR	965	4857	NR
450	90434	NR	580	154784	NR	710	14388	NR	840	3364	NR	970	4463	NR
455	63521	NR	585	156899	NR	715	12865	NR	845	3807	NR	975	3718	NR
460	48429	NR	590	157796	NR	720	11277	NR	850	2907	NR	980	3955	NR
465	36445	NR	595	157849	NR	725	10063	NR	855	3470	NR	985	4314	NR
470	31953	NR	600	155418	NR	730	8942	NR	860	3820	NR	990	4478	NR
475	32768	NR	605	151601	NR	735	7722	NR	865	3922	NR	995	2959	NR
480	37631	NR	610	146416	NR	740	6964	NR	870	4061	NR	1000	4570	NR
485	46354	NR	615	139241	NR	745	6117	NR	875	3975	NR			

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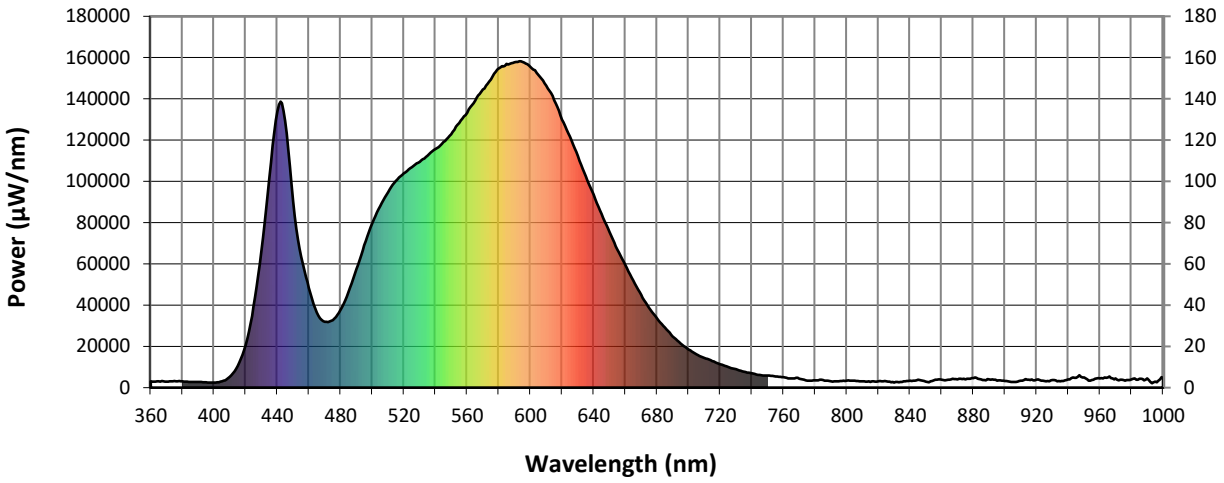
Scotopic Flux vs. Wavelength



Scotopic Lumens: 14236 **S/P: 1.59**

λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)
360	3123	NR	490	57459	NR	620	129941	NR	750	5858	NR	880	4622	NR
365	3041	NR	495	69038	NR	625	121678	NR	755	5395	NR	885	3949	NR
370	2965	NR	500	79493	NR	630	112252	NR	760	5011	NR	890	4035	NR
375	3195	NR	505	87950	NR	635	102369	NR	765	4514	NR	895	3391	NR
380	3028	NR	510	94704	NR	640	93616	NR	770	4375	NR	900	3268	NR
385	2738	NR	515	100214	NR	645	84211	NR	775	3450	NR	905	2767	NR
390	2690	NR	520	103961	NR	650	75380	NR	780	3547	NR	910	3391	NR
395	2604	NR	525	106854	NR	655	66946	NR	785	3648	NR	915	3784	NR
400	2384	NR	530	109533	NR	660	59483	NR	790	3081	NR	920	3790	NR
405	3031	NR	535	112417	NR	665	51858	NR	795	3104	NR	925	3175	NR
410	5239	NR	540	115725	NR	670	44882	NR	800	3444	NR	930	3642	NR
415	10499	NR	545	119091	NR	675	38742	NR	805	3315	NR	935	3040	NR
420	20790	NR	550	122884	NR	680	33597	NR	810	3022	NR	940	4039	NR
425	39276	NR	555	128300	NR	685	29101	NR	815	2832	NR	945	4797	NR
430	66418	NR	560	133274	NR	690	24855	NR	820	3142	NR	950	4945	NR
435	101961	NR	565	139112	NR	695	21367	NR	825	3115	NR	955	3757	NR
440	134023	NR	570	144467	NR	700	18479	NR	830	2520	NR	960	4539	NR
445	129385	NR	575	149331	NR	705	16131	NR	835	2783	NR	965	4857	NR
450	90434	NR	580	154784	NR	710	14388	NR	840	3364	NR	970	4463	NR
455	63521	NR	585	156899	NR	715	12865	NR	845	3807	NR	975	3718	NR
460	48429	NR	590	157796	NR	720	11277	NR	850	2907	NR	980	3955	NR
465	36445	NR	595	157849	NR	725	10063	NR	855	3470	NR	985	4314	NR
470	31953	NR	600	155418	NR	730	8942	NR	860	3820	NR	990	4478	NR
475	32768	NR	605	151601	NR	735	7722	NR	865	3922	NR	995	2959	NR
480	37631	NR	610	146416	NR	740	6964	NR	870	4061	NR	1000	4570	NR
485	46354	NR	615	139241	NR	745	6117	NR	875	3975	NR			

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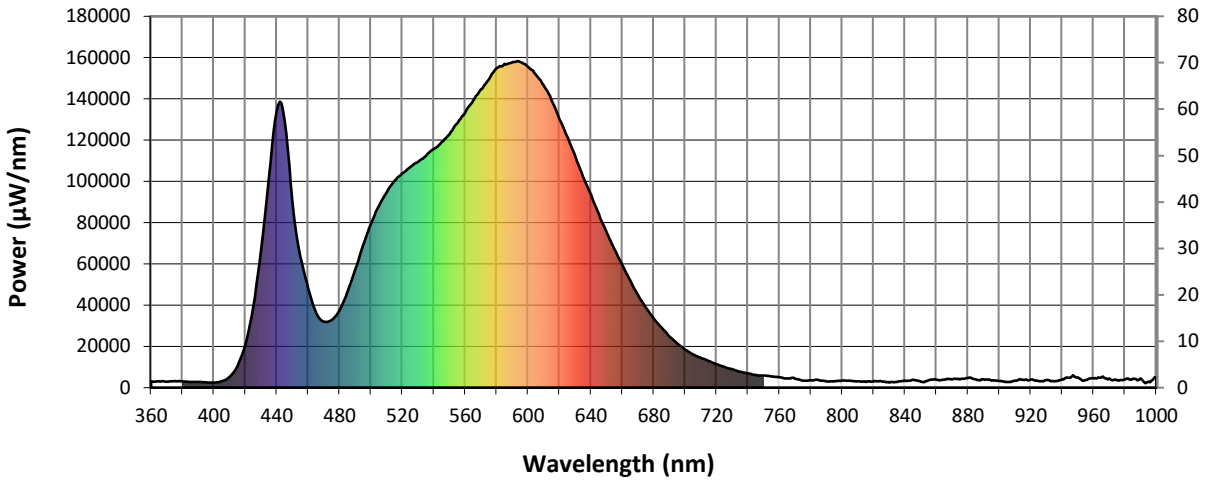
Melanopic Flux vs. Wavelength



Melanopic Lumens: 5542.6 **M/P: 0.62**

λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)
360	3123	NR	490	57459	NR	620	129941	NR	750	5858	NR	880	4622	NR
365	3041	NR	495	69038	NR	625	121678	NR	755	5395	NR	885	3949	NR
370	2965	NR	500	79493	NR	630	112252	NR	760	5011	NR	890	4035	NR
375	3195	NR	505	87950	NR	635	102369	NR	765	4514	NR	895	3391	NR
380	3028	NR	510	94704	NR	640	93616	NR	770	4375	NR	900	3268	NR
385	2738	NR	515	100214	NR	645	84211	NR	775	3450	NR	905	2767	NR
390	2690	NR	520	103961	NR	650	75380	NR	780	3547	NR	910	3391	NR
395	2604	NR	525	106854	NR	655	66946	NR	785	3648	NR	915	3784	NR
400	2384	NR	530	109533	NR	660	59483	NR	790	3081	NR	920	3790	NR
405	3031	NR	535	112417	NR	665	51858	NR	795	3104	NR	925	3175	NR
410	5239	NR	540	115725	NR	670	44882	NR	800	3444	NR	930	3642	NR
415	10499	NR	545	119091	NR	675	38742	NR	805	3315	NR	935	3040	NR
420	20790	NR	550	122884	NR	680	33597	NR	810	3022	NR	940	4039	NR
425	39276	NR	555	128300	NR	685	29101	NR	815	2832	NR	945	4797	NR
430	66418	NR	560	133274	NR	690	24855	NR	820	3142	NR	950	4945	NR
435	101961	NR	565	139112	NR	695	21367	NR	825	3115	NR	955	3757	NR
440	134023	NR	570	144467	NR	700	18479	NR	830	2520	NR	960	4539	NR
445	129385	NR	575	149331	NR	705	16131	NR	835	2783	NR	965	4857	NR
450	90434	NR	580	154784	NR	710	14388	NR	840	3364	NR	970	4463	NR
455	63521	NR	585	156899	NR	715	12865	NR	845	3807	NR	975	3718	NR
460	48429	NR	590	157796	NR	720	11277	NR	850	2907	NR	980	3955	NR
465	36445	NR	595	157849	NR	725	10063	NR	855	3470	NR	985	4314	NR
470	31953	NR	600	155418	NR	730	8942	NR	860	3820	NR	990	4478	NR
475	32768	NR	605	151601	NR	735	7722	NR	865	3922	NR	995	2959	NR
480	37631	NR	610	146416	NR	740	6964	NR	870	4061	NR	1000	4570	NR
485	46354	NR	615	139241	NR	745	6117	NR	875	3975	NR			

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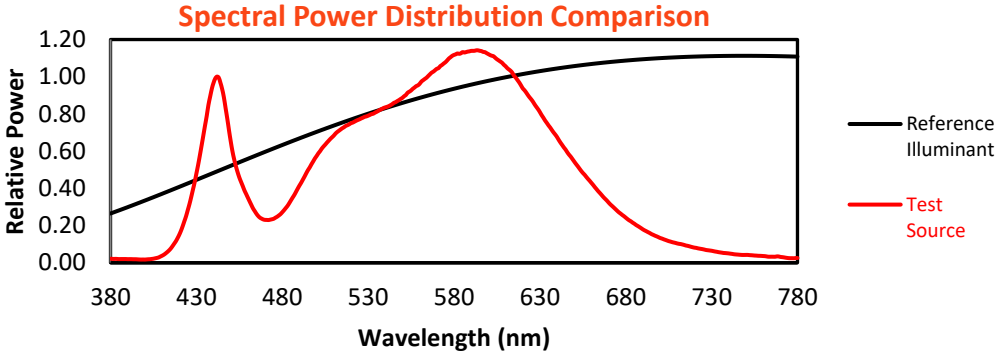
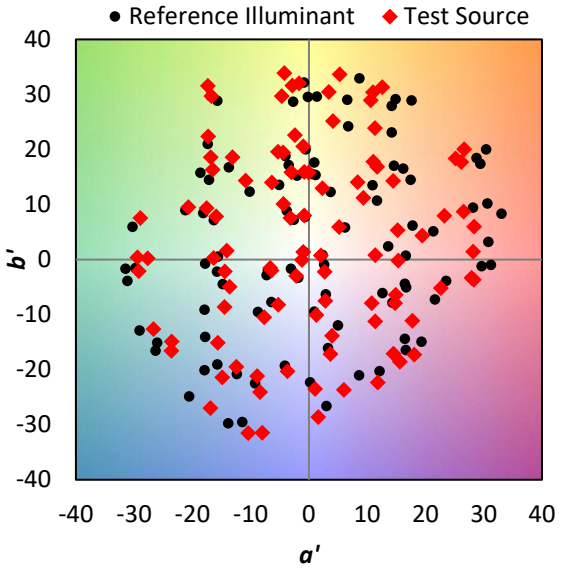
Summary

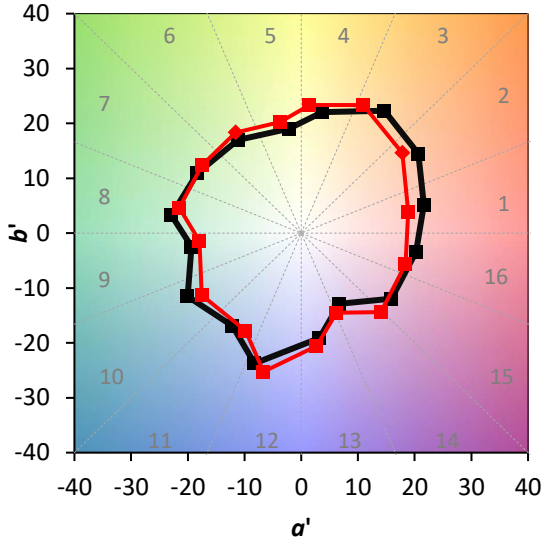
R_f = 82.7
R_g = 96.5
CIE R_a = 79.8
R_9 = -8.6

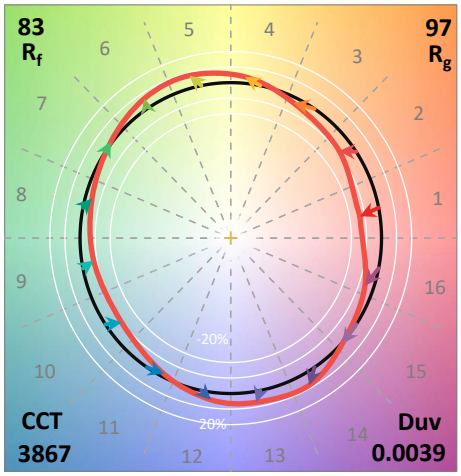
Spectral Power Distribution Comparison

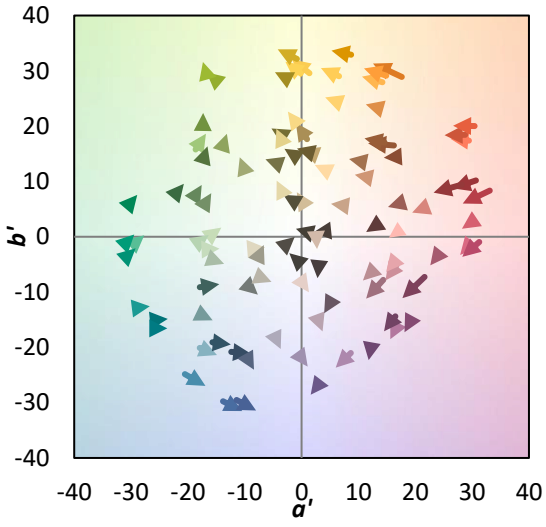


Color Vector Graphics









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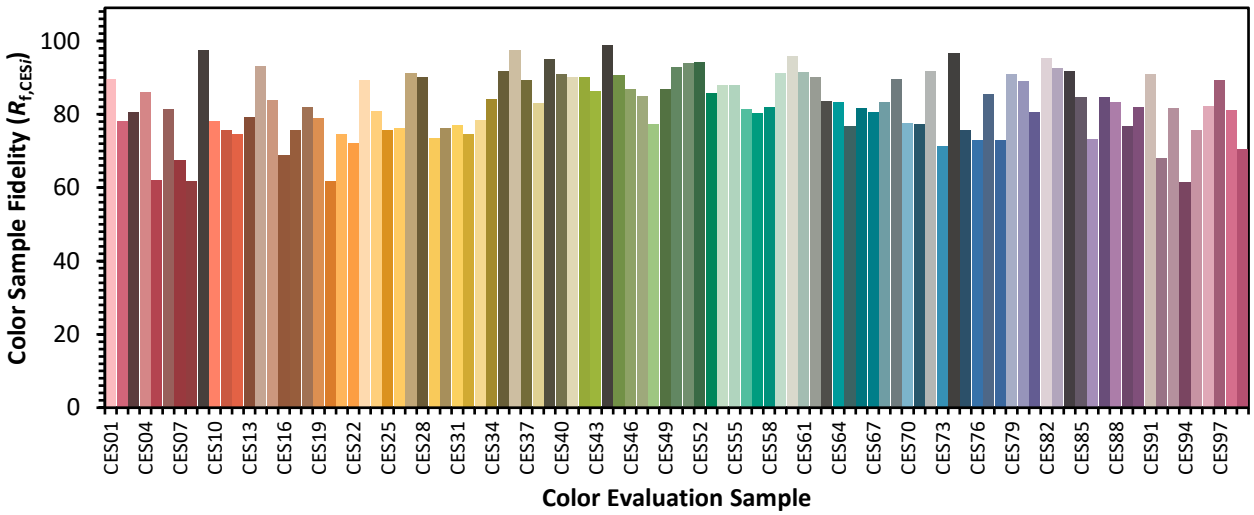
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 85	CES26 = 76	CES51 = 94	CES76 = 73
CES02 = 61	CES27 = 91	CES52 = 94	CES77 = 85
CES03 = 31	CES28 = 90	CES53 = 86	CES78 = 73
CES04 = 69	CES29 = 73	CES54 = 88	CES79 = 91
CES05 = 48	CES30 = 76	CES55 = 88	CES80 = 89
CES06 = 50	CES31 = 77	CES56 = 81	CES81 = 80
CES07 = 40	CES32 = 74	CES57 = 80	CES82 = 95
CES08 = 39	CES33 = 78	CES58 = 82	CES83 = 92
CES09 = 29	CES34 = 84	CES59 = 91	CES84 = 92
CES10 = 74	CES35 = 92	CES60 = 96	CES85 = 85
CES11 = 57	CES36 = 97	CES61 = 92	CES86 = 73
CES12 = 63	CES37 = 89	CES62 = 90	CES87 = 85
CES13 = 42	CES38 = 83	CES63 = 83	CES88 = 83
CES14 = 74	CES39 = 95	CES64 = 83	CES89 = 77
CES15 = 71	CES40 = 91	CES65 = 77	CES90 = 82
CES16 = 47	CES41 = 90	CES66 = 82	CES91 = 91
CES17 = 49	CES42 = 90	CES67 = 80	CES92 = 68
CES18 = 56	CES43 = 86	CES68 = 83	CES93 = 82
CES19 = 71	CES44 = 99	CES69 = 90	CES94 = 61
CES20 = 65	CES45 = 91	CES70 = 77	CES95 = 76
CES21 = 86	CES46 = 87	CES71 = 77	CES96 = 82
CES22 = 78	CES47 = 85	CES72 = 92	CES97 = 89
CES23 = 91	CES48 = 77	CES73 = 71	CES98 = 81
CES24 = 90	CES49 = 87	CES74 = 97	CES99 = 70
CES25 = 71	CES50 = 93	CES75 = 76	



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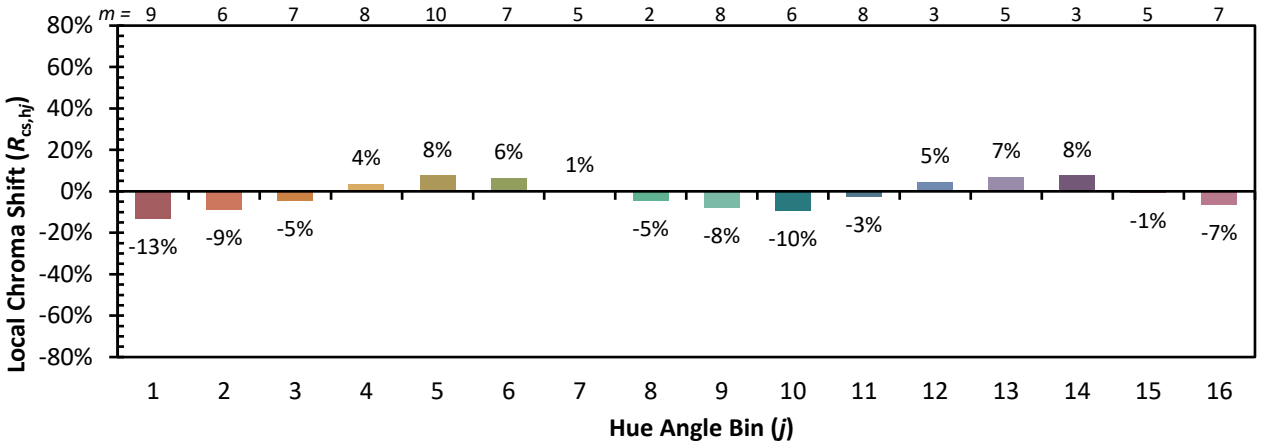
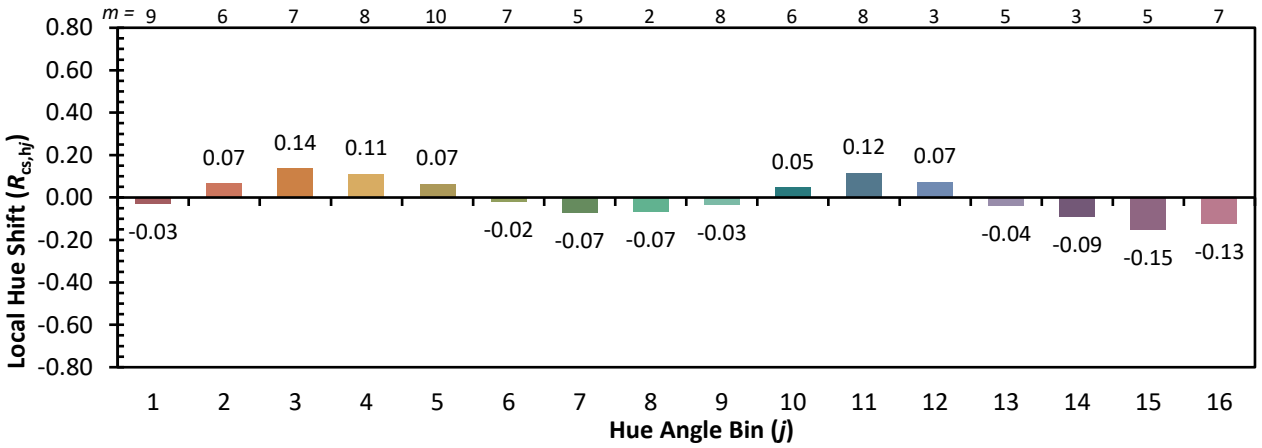
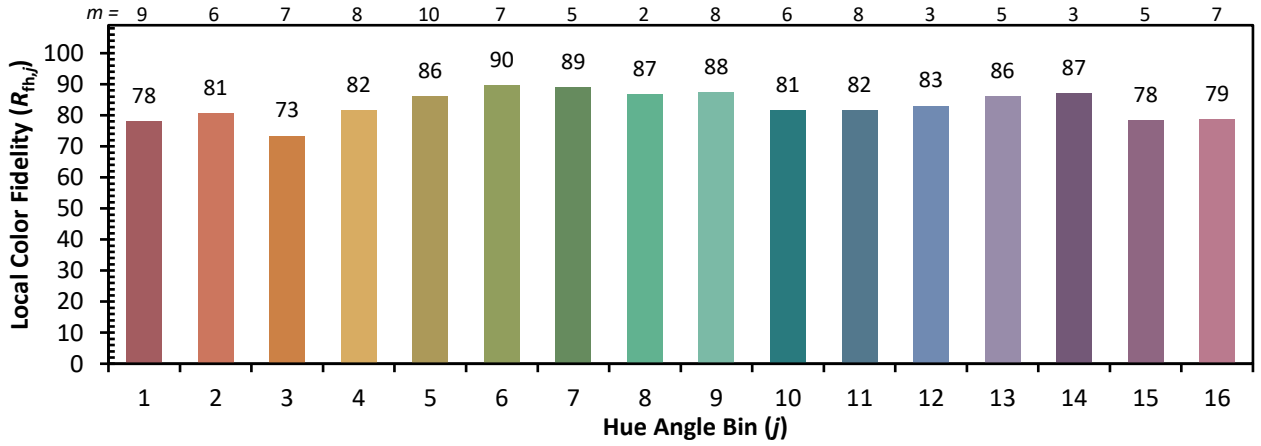
Color Rendition by Hue-Angle Bin







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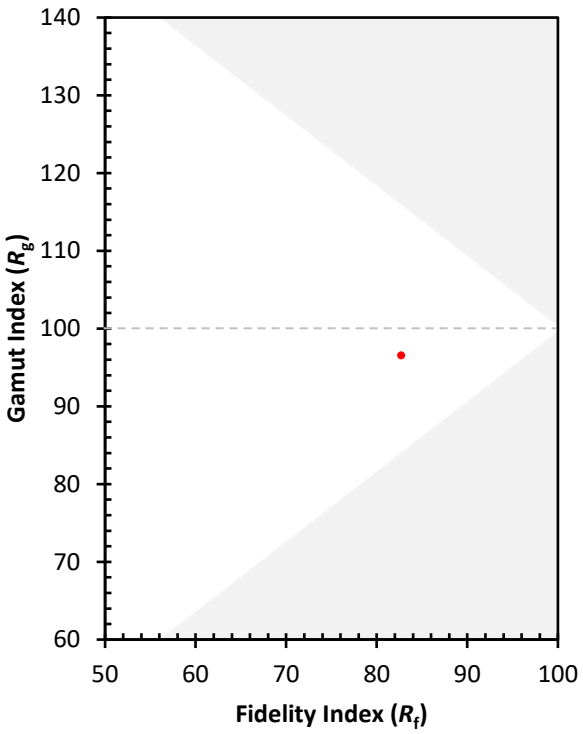
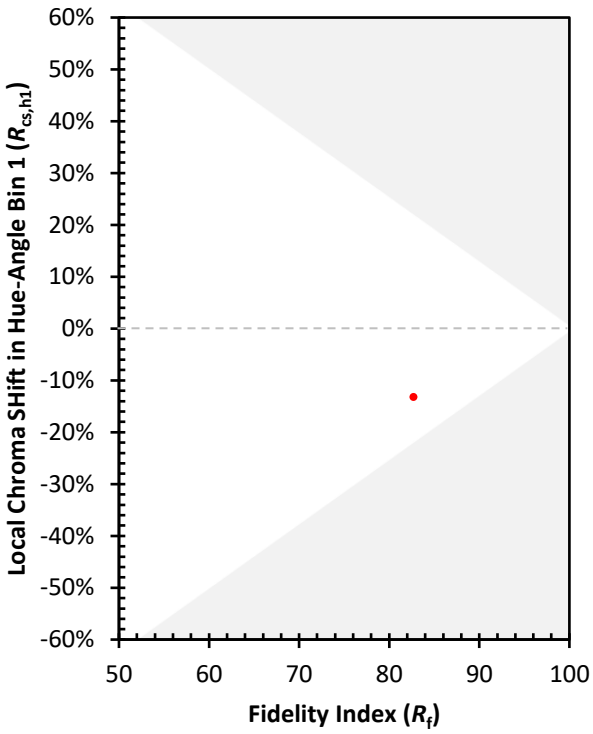
Measure Comparisons





(END OF REPORT)