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: P870996

Luminaire Tested: **EMM2-HTN-SA2C-840-U-T5W**

Issue Date: 09/05/2024

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:	P870996
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	09/05/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HTN-SA2C-840-U-T5W
Description:	EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 120W 80CRI 4000K FIXTURE w/ TYPE V SQUARE WIDE DISTRIBUTION OPTIC
Light Source:	(20) 4000K CCT, 80 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	13489 lumens
Efficiency:	N/A
Efficacy:	133.6 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):	101
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.99
Total Harmonic Distortion (THDi):	9.45%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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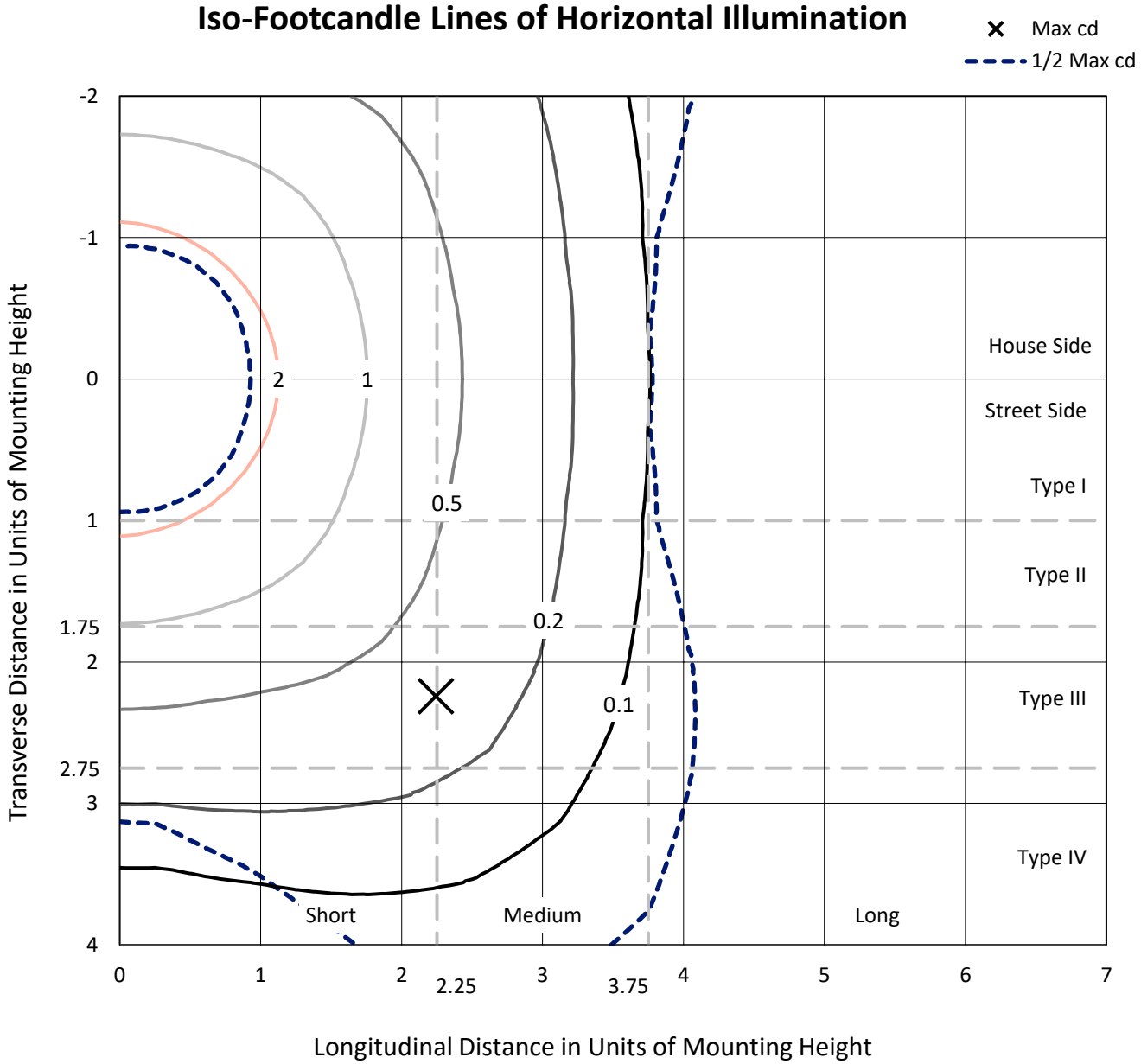
Scaled Data Report

REPORT NUMBER: P870996
CATALOG NUMBER: EMM2-HTN-SA2C-840-U-T5W

Iso-Footcandle Lines of Horizontal Illumination



Based on 20 foot mounting height. Maximum calculated value = 2.4 fc
Type V - Short - N/A

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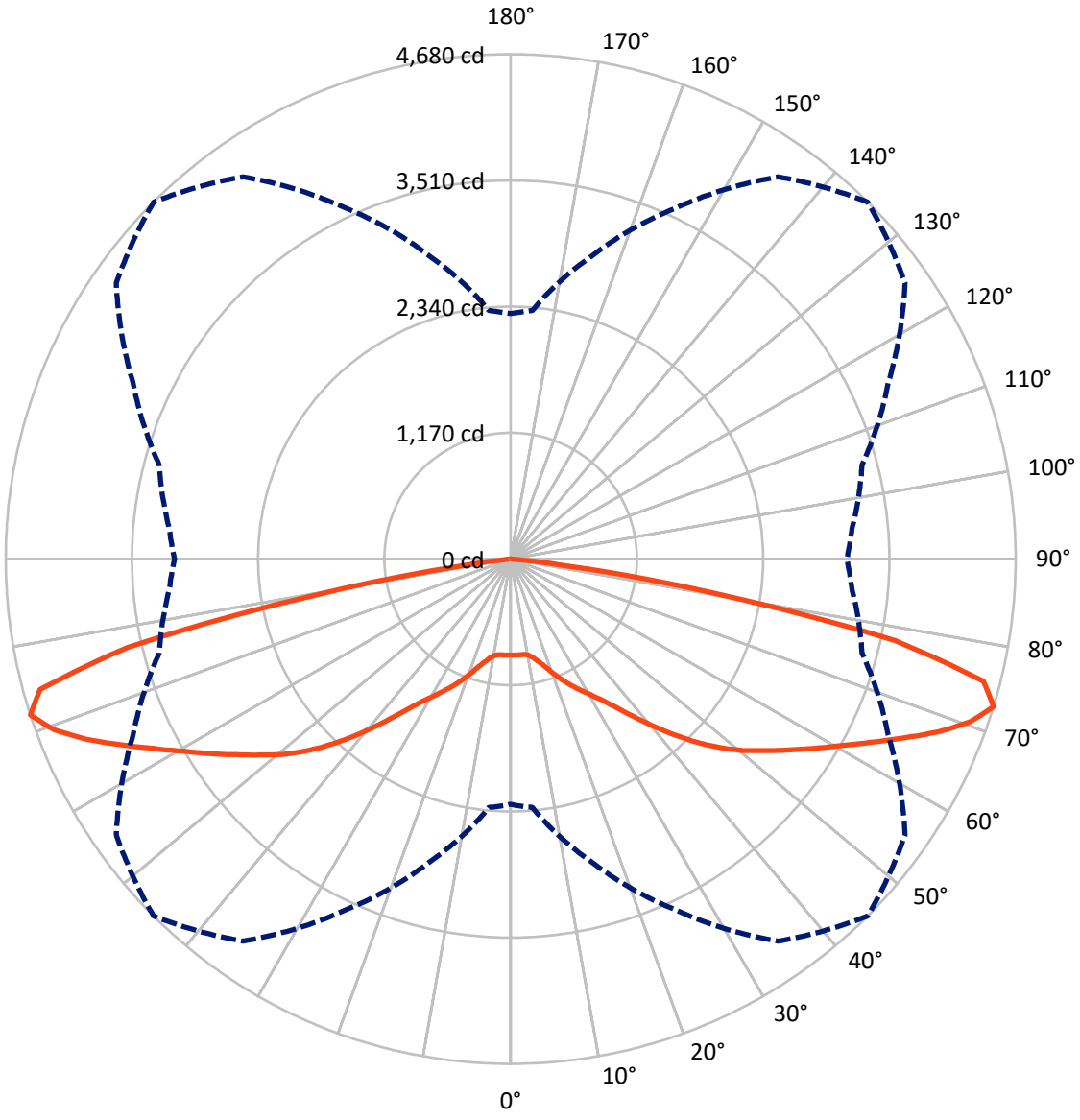
Luminous Intensity Polar Plot



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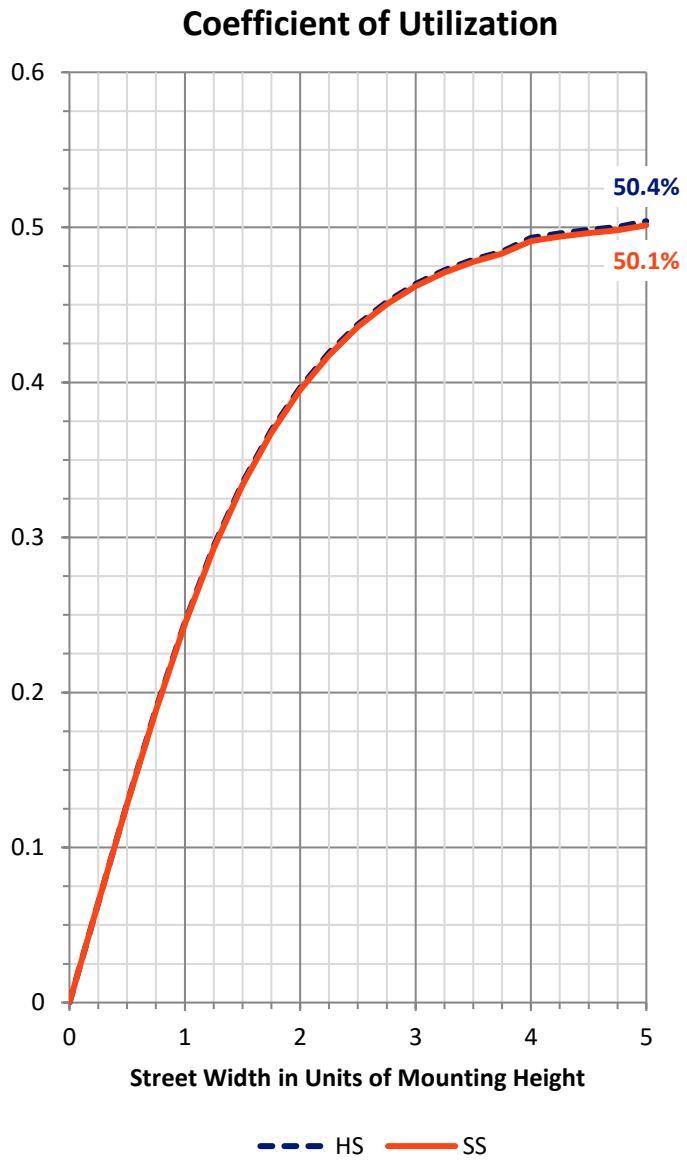
REPORT NUMBER: P870996
CATALOG NUMBER: EMM2-HTN-SA2C-840-U-T5W

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	6744.5	0.0	6744.5
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	6744.5	0.0	6744.5
	% Fixture	50.0	0.0	50.0
Total	Lumens	13489.0	0.0	13489.0
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	85.3	0.6
10°-20°	284.9	2.1
20°-30°	587.7	4.4
30°-40°	1082.0	8.0
40°-50°	1902.4	14.1
50°-60°	2759.2	20.5
60°-70°	3596.9	26.7
70°-80°	2989.9	22.2
80°-90°	200.8	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°	13489.0	100.0
0°-180°	13489.0	100.0



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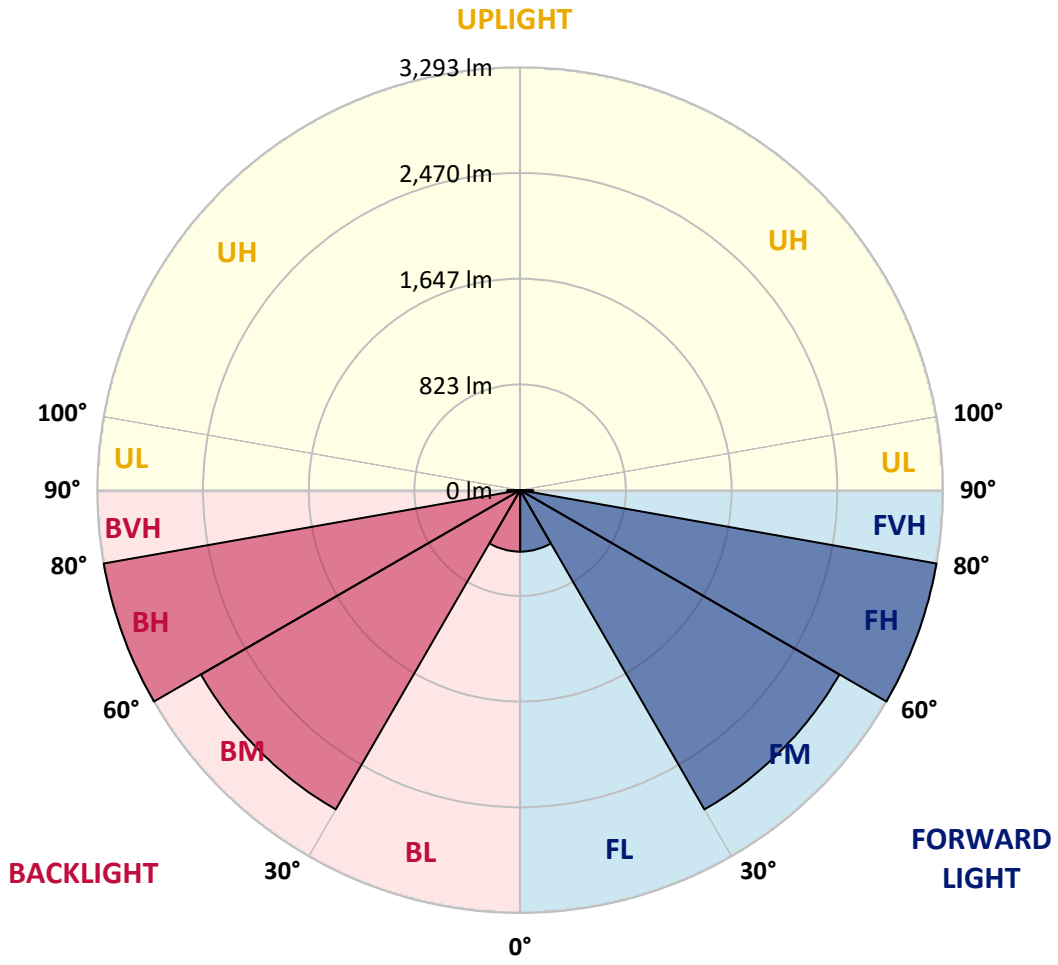
LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	479.0	3.6			
FM	(30°-60°)	2871.8	21.3			
FH	(60°-80°)	3293.4	24.4			G2/5000
FVH	(80°-90°)	100.4	0.7			G2/225
BL	(0°-30°)	479.0	3.6	B1/500		
BM	(30°-60°)	2871.8	21.3	B3/5000		
BH	(60°-80°)	3293.4	24.4	B4/5000		G2/5000
BVH	(80°-90°)	100.4	0.7			G2/225
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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CATALOG NUMBER: EMM2-HTN-SA2C-840-U-T5W

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	890.5	890.5	890.5	890.5	890.5	*890.5*	890.5	890.5	890.5	890.5	890.5
2.5°	887.7	889.1	889.1	889.1	890.5	*891.9*	893.3	894.7	897.5	898.9	898.9
5°	891.9	890.5	889.1	891.9	891.9	*891.9*	893.3	894.7	894.7	894.7	896.1
7.5°	887.7	889.1	887.7	887.7	891.9	*893.3*	891.9	890.5	890.5	891.9	891.9
10°	903.1	901.7	900.3	900.3	904.5	*905.9*	904.5	903.1	903.1	905.9	905.9
12.5°	938.0	940.8	932.5	932.5	938.0	*940.8*	936.6	935.2	936.6	939.4	939.4
15°	992.6	991.2	985.6	980.0	985.6	*989.8*	984.2	981.4	982.8	989.8	984.2
17.5°	1052.7	1054.1	1048.5	1042.9	1047.1	*1052.7*	1044.3	1037.3	1038.7	1041.5	1038.7
20°	1119.8	1118.4	1117.0	1117.0	1125.4	*1132.4*	1119.8	1103.0	1098.8	1096.0	1096.0
22.5°	1168.7	1172.9	1174.3	1186.9	1206.5	*1213.4*	1196.7	1174.3	1157.5	1149.1	1143.5
25°	1245.6	1241.4	1238.6	1252.6	1281.9	*1294.5*	1273.6	1242.8	1226.0	1224.6	1228.8
27.5°	1315.5	1315.5	1321.1	1335.1	1363.0	*1375.6*	1357.4	1326.7	1318.3	1318.3	1314.1
30°	1406.4	1402.2	1407.8	1431.5	1452.5	*1460.9*	1445.5	1424.5	1417.5	1417.5	1410.6
32.5°	1512.6	1514.0	1522.4	1537.8	1558.7	*1560.1*	1554.5	1544.8	1540.6	1536.4	1543.4
35°	1674.8	1674.8	1672.0	1683.2	1688.8	*1691.6*	1694.3	1690.2	1690.2	1690.2	1684.6
37.5°	1876.1	1864.9	1863.5	1853.7	1846.7	*1853.7*	1866.3	1880.3	1891.5	1884.5	1881.7
40°	2076.0	2070.4	2053.6	2038.2	2032.7	*2035.5*	2050.8	2080.2	2092.8	2092.8	2104.0
42.5°	2291.3	2280.1	2259.1	2241.0	2225.6	*2229.8*	2243.8	2280.1	2308.1	2320.6	2315.0
45°	2484.2	2474.4	2453.4	2436.7	2425.5	*2424.1*	2442.3	2466.0	2503.8	2515.0	2523.3
47.5°	2649.2	2642.2	2624.0	2607.2	2611.4	*2612.8*	2618.4	2639.4	2670.1	2685.5	2684.1
50°	2783.4	2777.8	2761.0	2768.0	2779.2	*2790.4*	2783.4	2797.4	2816.9	2823.9	2829.5
52.5°	2906.4	2898.0	2886.8	2899.4	2928.8	*2951.1*	2955.3	2945.5	2951.1	2955.3	2951.1
55°	3028.0	3018.2	3015.4	3037.8	3082.5	*3124.5*	3120.3	3092.3	3085.3	3076.9	3072.8
57.5°	3127.3	3120.3	3131.5	3169.2	3255.9	*3311.8*	3293.6	3229.3	3201.4	3181.8	3176.2
60°	3190.2	3188.8	3213.9	3302.0	3433.4	*3511.7*	3482.4	3371.9	3309.0	3290.8	3282.4
62.5°	3223.7	3225.1	3269.9	3426.4	3636.1	*3742.4*	3690.7	3521.5	3423.6	3405.5	3408.3
65°	3254.5	3250.3	3309.0	3531.3	3855.6	*3999.6*	3929.7	3701.8	3559.2	3522.9	3522.9
67.5°	3276.9	3281.1	3369.1	3636.1	4069.5	*4275.0*	4173.0	3893.4	3704.6	3650.1	3643.1
70°	2994.5	3035.0	3310.4	3706.0	4238.7	*4518.3*	4384.1	4010.8	3710.2	3555.1	3539.7
72.5°	*2274.5*	*2312.3*	*2907.8*	*3581.6*	*4325.3*	*4680.4*	*4462.3*	*3861.2*	*3371.9*	*3174.8*	*3116.1*
75°	1500.0	1526.6	2166.9	3128.7	4084.9	*4526.6*	4063.9	3325.8	2654.8	2398.9	2414.3
77.5°	668.2	753.5	1381.2	2440.9	3364.9	*3643.1*	3099.3	2268.9	1621.7	1372.8	1346.3
80°	279.6	306.2	521.4	1301.5	1950.2	*1866.3*	1319.7	760.5	483.7	376.1	363.5
82.5°	81.1	83.9	103.5	225.1	397.0	*466.9*	281.0	142.6	135.6	107.6	99.3
85°	5.6	5.6	8.4	14.0	19.6	*32.2*	36.3	41.9	47.5	40.5	40.5
87.5°	2.8	2.8	2.8	4.2	4.2	*5.6*	4.2	4.2	4.2	4.2	4.2
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: SP1-2407-157-8

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-40-840-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-40-840-U-5WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

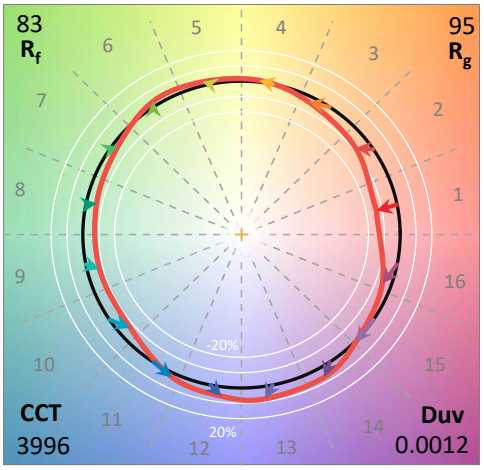
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-157-8
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	09/05/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	Streetworks
Catalog Number:	**MEM2-HTN-SA-40-840-U-5WQ**
Description:	Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K):	3996
CIE u':	0.2245
CIE v':	0.5031
Duv:	0.0012
CIE x:	0.3815
CIE y:	0.3799
CIE z:	0.2386
Peak Wavelength (nm):	449
Dominant Wavelength (nm):	578
Purity:	28.49233
Rf:	82.6
Rg:	95.1

CRI (Ra):	80.6
R1:	78.1
R2:	87.1
R3:	94.5
R4:	79.7
R5:	78.7
R6:	82.7
R7:	84.3
R8:	59.5
R9:	-5.8
R10:	70.3
R11:	78.7
R12:	60.5
R13:	80.2
R14:	97.2
R15:	70.6



Test Conditions

Stabilization Time:	29M
Operation Time:	1H 29M
Sphere Temperature (°C):	24.3

REPORT NUMBER: SP1-2407-157-8

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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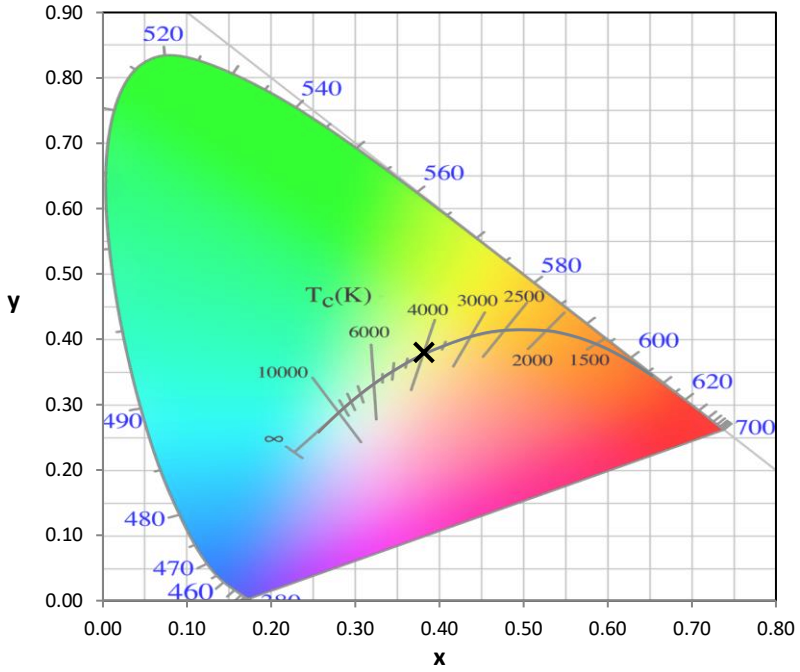
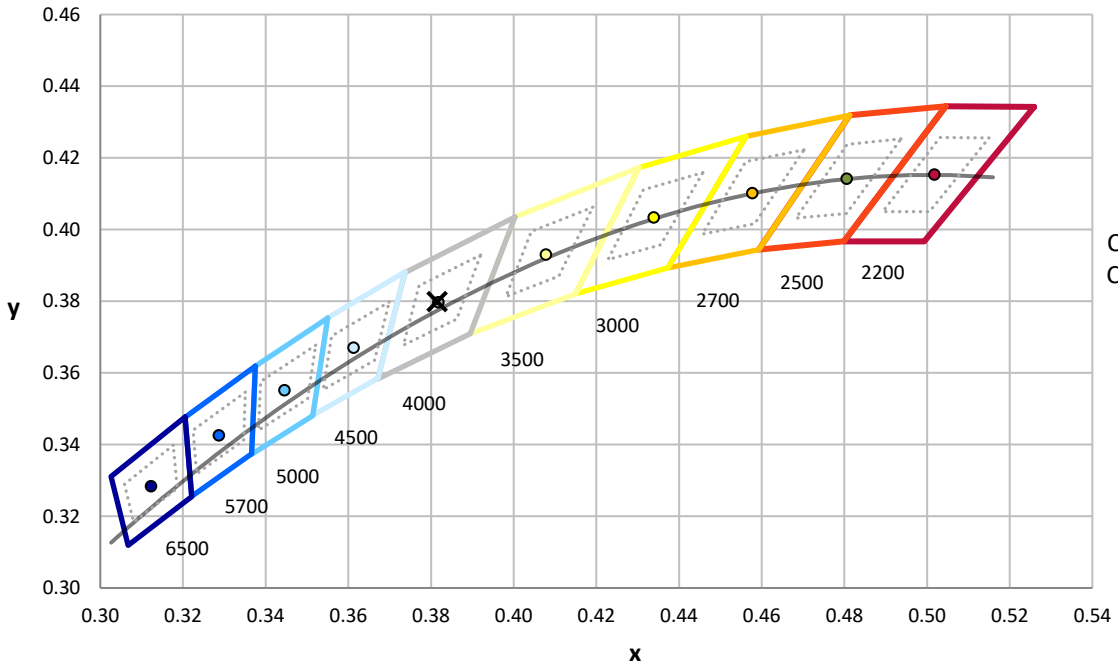
CIE 1931 Chromaticity Diagram



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



CCT = 3996K
CIE x = 0.3815
CIE y = 0.3799
Duv = 0.0012

Point lies inside the ANSI 4000K 4-step quadrangle

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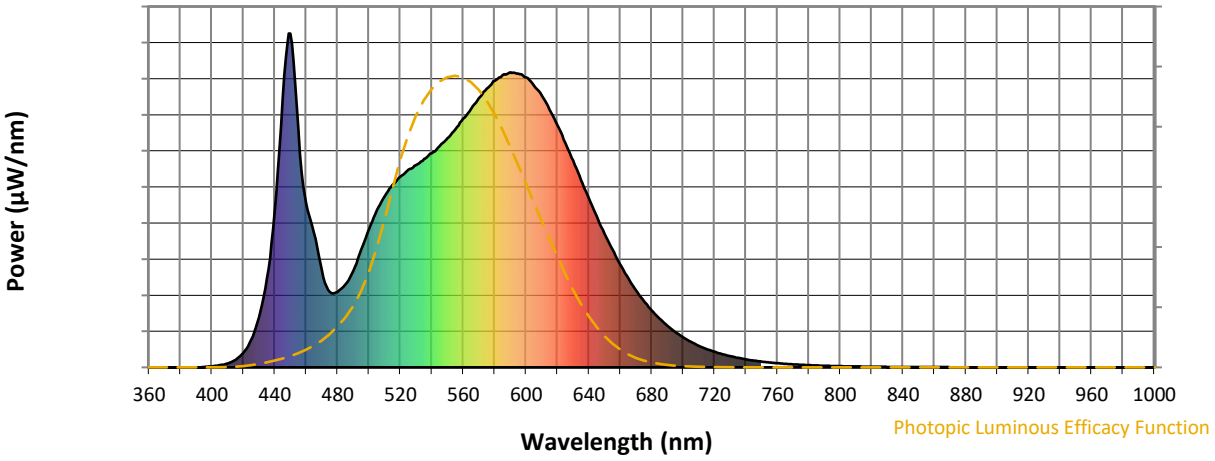
Photopic Flux vs. Wavelength

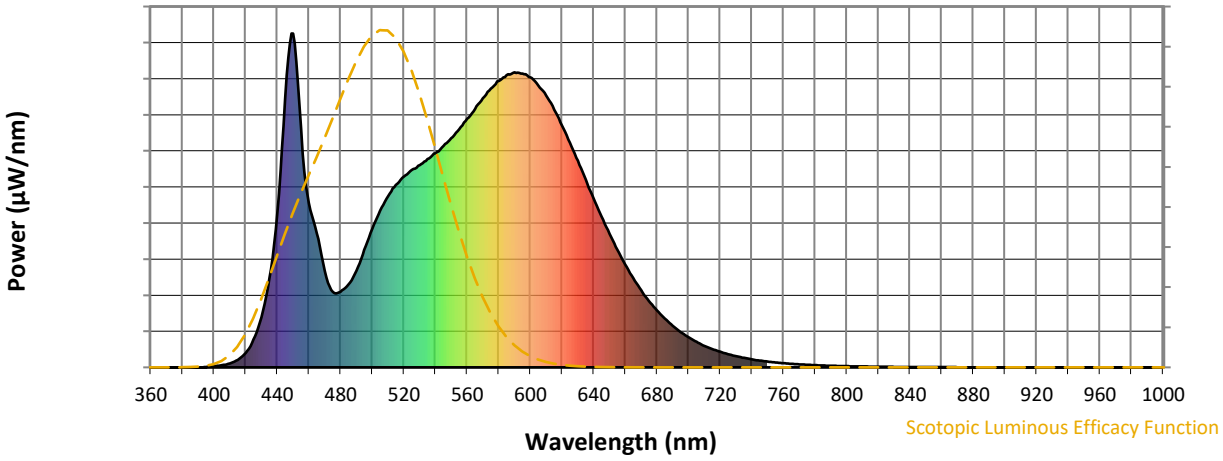


Photopic Lumens: NR

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	289	NR	620	725	NR	750	17	NR	880	0	NR
365	0	NR	495	351	NR	625	673	NR	755	15	NR	885	0	NR
370	0	NR	500	414	NR	630	619	NR	760	13	NR	890	0	NR
375	0	NR	505	470	NR	635	562	NR	765	11	NR	895	0	NR
380	0	NR	510	513	NR	640	506	NR	770	9	NR	900	0	NR
385	0	NR	515	546	NR	645	452	NR	775	8	NR	905	0	NR
390	0	NR	520	571	NR	650	400	NR	780	7	NR	910	0	NR
395	1	NR	525	592	NR	655	352	NR	785	6	NR	915	0	NR
400	3	NR	530	606	NR	660	307	NR	790	5	NR	920	0	NR
405	6	NR	535	624	NR	665	267	NR	795	4	NR	925	0	NR
410	12	NR	540	642	NR	670	231	NR	800	4	NR	930	0	NR
415	22	NR	545	663	NR	675	199	NR	805	3	NR	935	0	NR
420	44	NR	550	686	NR	680	171	NR	810	3	NR	940	0	NR
425	83	NR	555	713	NR	685	146	NR	815	2	NR	945	0	NR
430	150	NR	560	745	NR	690	125	NR	820	2	NR	950	0	NR
435	267	NR	565	774	NR	695	106	NR	825	2	NR	955	0	NR
440	466	NR	570	806	NR	700	90	NR	830	1	NR	960	0	NR
445	804	NR	575	835	NR	705	76	NR	835	1	NR	965	0	NR
450	1000	NR	580	858	NR	710	65	NR	840	1	NR	970	0	NR
455	715	NR	585	875	NR	715	55	NR	845	1	NR	975	0	NR
460	492	NR	590	884	NR	720	47	NR	850	1	NR	980	0	NR
465	402	NR	595	880	NR	725	40	NR	855	1	NR	985	0	NR
470	288	NR	600	868	NR	730	34	NR	860	1	NR	990	0	NR
475	226	NR	605	844	NR	735	28	NR	865	1	NR	995	0	NR
480	227	NR	610	814	NR	740	24	NR	870	0	NR	1000	0	NR
485	248	NR	615	771	NR	745	20	NR	875	0	NR			

REPORT NUMBER: SP1-2407-157-8

Scotopic Flux vs. Wavelength

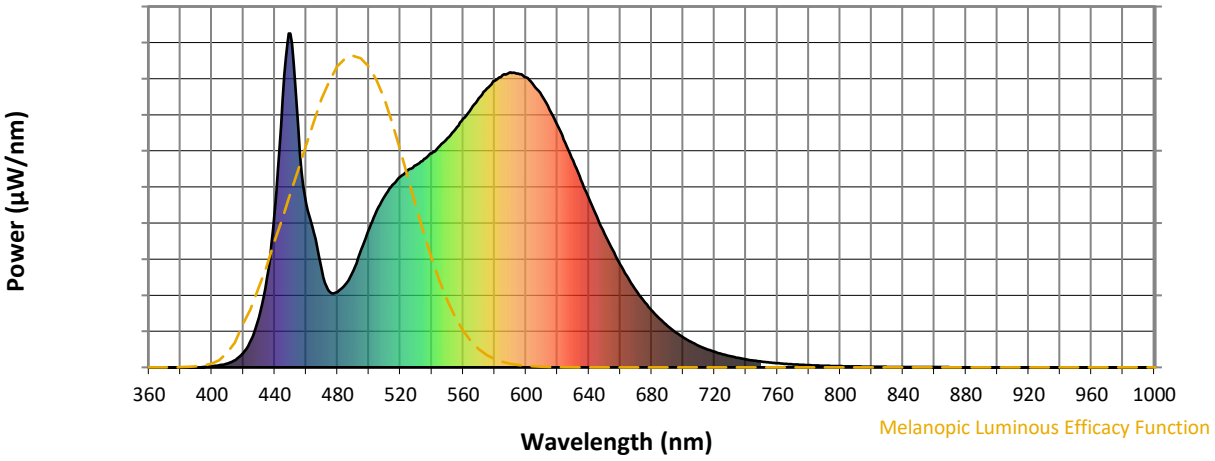


Scotopic Lumens: NR **S/P: 1.66**

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	289	NR	620	725	NR	750	17	NR	880	0	NR
365	0	NR	495	351	NR	625	673	NR	755	15	NR	885	0	NR
370	0	NR	500	414	NR	630	619	NR	760	13	NR	890	0	NR
375	0	NR	505	470	NR	635	562	NR	765	11	NR	895	0	NR
380	0	NR	510	513	NR	640	506	NR	770	9	NR	900	0	NR
385	0	NR	515	546	NR	645	452	NR	775	8	NR	905	0	NR
390	0	NR	520	571	NR	650	400	NR	780	7	NR	910	0	NR
395	1	NR	525	592	NR	655	352	NR	785	6	NR	915	0	NR
400	3	NR	530	606	NR	660	307	NR	790	5	NR	920	0	NR
405	6	NR	535	624	NR	665	267	NR	795	4	NR	925	0	NR
410	12	NR	540	642	NR	670	231	NR	800	4	NR	930	0	NR
415	22	NR	545	663	NR	675	199	NR	805	3	NR	935	0	NR
420	44	NR	550	686	NR	680	171	NR	810	3	NR	940	0	NR
425	83	NR	555	713	NR	685	146	NR	815	2	NR	945	0	NR
430	150	NR	560	745	NR	690	125	NR	820	2	NR	950	0	NR
435	267	NR	565	774	NR	695	106	NR	825	2	NR	955	0	NR
440	466	NR	570	806	NR	700	90	NR	830	1	NR	960	0	NR
445	804	NR	575	835	NR	705	76	NR	835	1	NR	965	0	NR
450	1000	NR	580	858	NR	710	65	NR	840	1	NR	970	0	NR
455	715	NR	585	875	NR	715	55	NR	845	1	NR	975	0	NR
460	492	NR	590	884	NR	720	47	NR	850	1	NR	980	0	NR
465	402	NR	595	880	NR	725	40	NR	855	1	NR	985	0	NR
470	288	NR	600	868	NR	730	34	NR	860	1	NR	990	0	NR
475	226	NR	605	844	NR	735	28	NR	865	1	NR	995	0	NR
480	227	NR	610	814	NR	740	24	NR	870	0	NR	1000	0	NR
485	248	NR	615	771	NR	745	20	NR	875	0	NR			

REPORT NUMBER: SP1-2407-157-8

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 3.37**

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	289	NR	620	725	NR	750	17	NR	880	0	NR
365	0	NR	495	351	NR	625	673	NR	755	15	NR	885	0	NR
370	0	NR	500	414	NR	630	619	NR	760	13	NR	890	0	NR
375	0	NR	505	470	NR	635	562	NR	765	11	NR	895	0	NR
380	0	NR	510	513	NR	640	506	NR	770	9	NR	900	0	NR
385	0	NR	515	546	NR	645	452	NR	775	8	NR	905	0	NR
390	0	NR	520	571	NR	650	400	NR	780	7	NR	910	0	NR
395	1	NR	525	592	NR	655	352	NR	785	6	NR	915	0	NR
400	3	NR	530	606	NR	660	307	NR	790	5	NR	920	0	NR
405	6	NR	535	624	NR	665	267	NR	795	4	NR	925	0	NR
410	12	NR	540	642	NR	670	231	NR	800	4	NR	930	0	NR
415	22	NR	545	663	NR	675	199	NR	805	3	NR	935	0	NR
420	44	NR	550	686	NR	680	171	NR	810	3	NR	940	0	NR
425	83	NR	555	713	NR	685	146	NR	815	2	NR	945	0	NR
430	150	NR	560	745	NR	690	125	NR	820	2	NR	950	0	NR
435	267	NR	565	774	NR	695	106	NR	825	2	NR	955	0	NR
440	466	NR	570	806	NR	700	90	NR	830	1	NR	960	0	NR
445	804	NR	575	835	NR	705	76	NR	835	1	NR	965	0	NR
450	1000	NR	580	858	NR	710	65	NR	840	1	NR	970	0	NR
455	715	NR	585	875	NR	715	55	NR	845	1	NR	975	0	NR
460	492	NR	590	884	NR	720	47	NR	850	1	NR	980	0	NR
465	402	NR	595	880	NR	725	40	NR	855	1	NR	985	0	NR
470	288	NR	600	868	NR	730	34	NR	860	1	NR	990	0	NR
475	226	NR	605	844	NR	735	28	NR	865	1	NR	995	0	NR
480	227	NR	610	814	NR	740	24	NR	870	0	NR	1000	0	NR
485	248	NR	615	771	NR	745	20	NR	875	0	NR			

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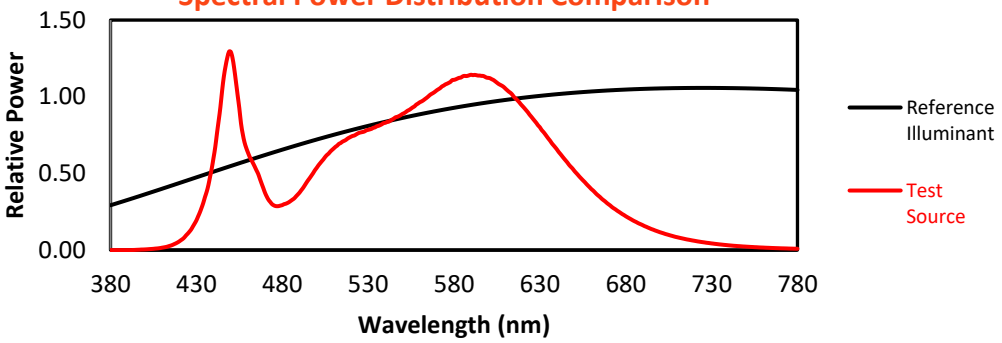
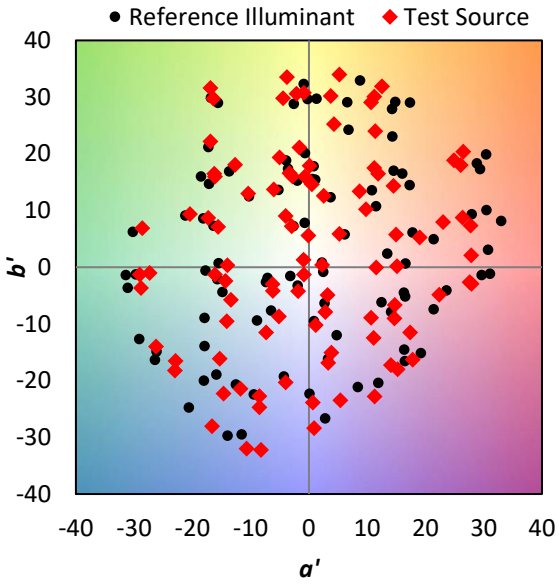
Summary

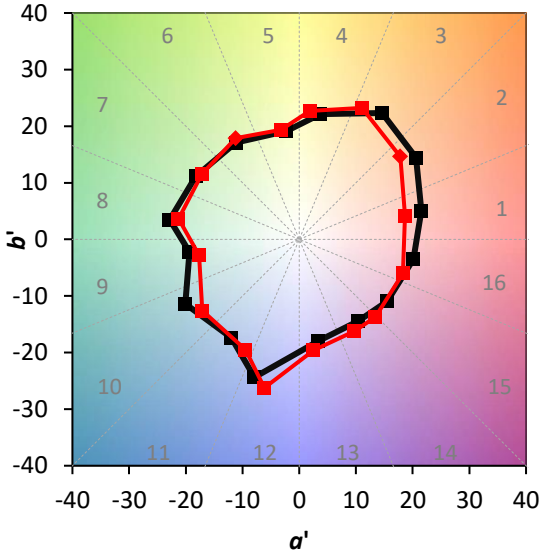
R_f = 82.6
R_g = 95.1
CIE R_a = 80.6
R_9 = -5.8

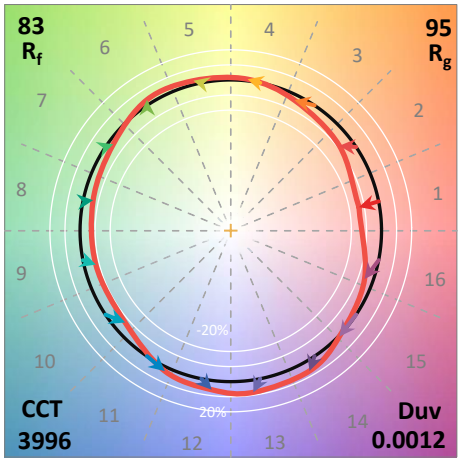
Spectral Power Distribution Comparison

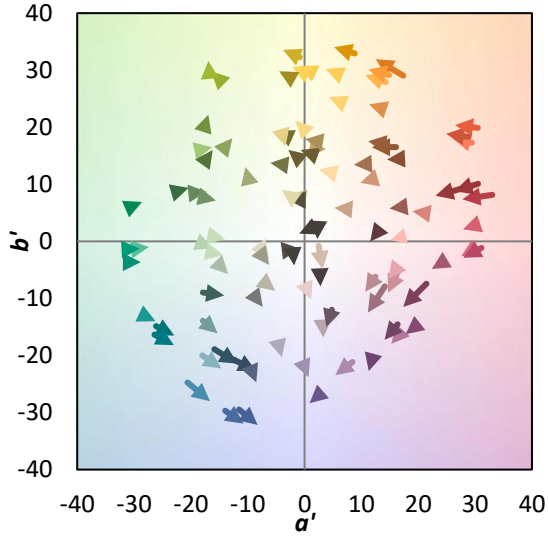


Color Vector Graphics









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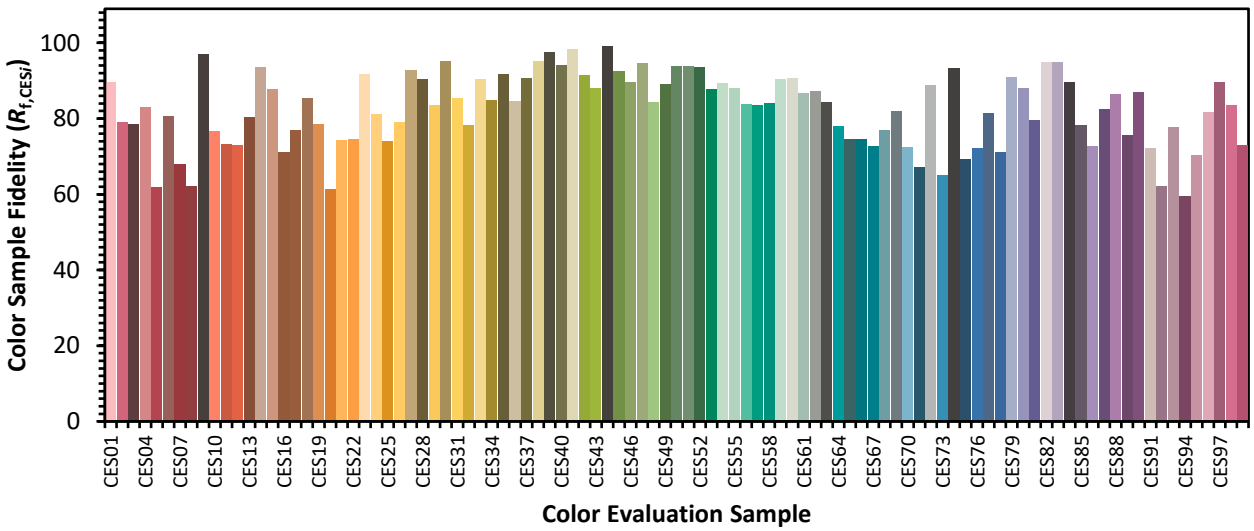
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 85	CES26 = 79	CES51 = 94	CES76 = 72
CES02 = 61	CES27 = 93	CES52 = 94	CES77 = 82
CES03 = 31	CES28 = 90	CES53 = 88	CES78 = 71
CES04 = 69	CES29 = 83	CES54 = 89	CES79 = 91
CES05 = 48	CES30 = 95	CES55 = 88	CES80 = 88
CES06 = 50	CES31 = 86	CES56 = 84	CES81 = 80
CES07 = 40	CES32 = 78	CES57 = 84	CES82 = 95
CES08 = 39	CES33 = 90	CES58 = 84	CES83 = 95
CES09 = 29	CES34 = 85	CES59 = 90	CES84 = 90
CES10 = 74	CES35 = 92	CES60 = 91	CES85 = 78
CES11 = 57	CES36 = 85	CES61 = 87	CES86 = 73
CES12 = 63	CES37 = 91	CES62 = 87	CES87 = 83
CES13 = 42	CES38 = 95	CES63 = 84	CES88 = 86
CES14 = 74	CES39 = 98	CES64 = 78	CES89 = 76
CES15 = 71	CES40 = 94	CES65 = 75	CES90 = 87
CES16 = 46	CES41 = 98	CES66 = 75	CES91 = 72
CES17 = 49	CES42 = 92	CES67 = 73	CES92 = 62
CES18 = 56	CES43 = 88	CES68 = 77	CES93 = 78
CES19 = 71	CES44 = 99	CES69 = 82	CES94 = 60
CES20 = 65	CES45 = 93	CES70 = 72	CES95 = 70
CES21 = 86	CES46 = 90	CES71 = 67	CES96 = 82
CES22 = 78	CES47 = 95	CES72 = 89	CES97 = 90
CES23 = 91	CES48 = 84	CES73 = 65	CES98 = 84
CES24 = 90	CES49 = 89	CES74 = 93	CES99 = 73
CES25 = 71	CES50 = 94	CES75 = 69	



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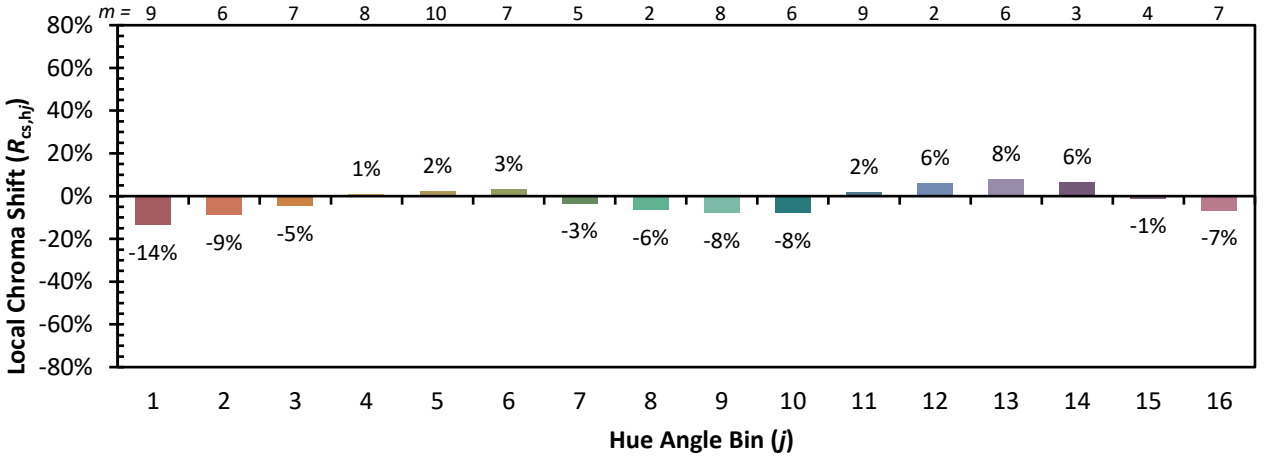
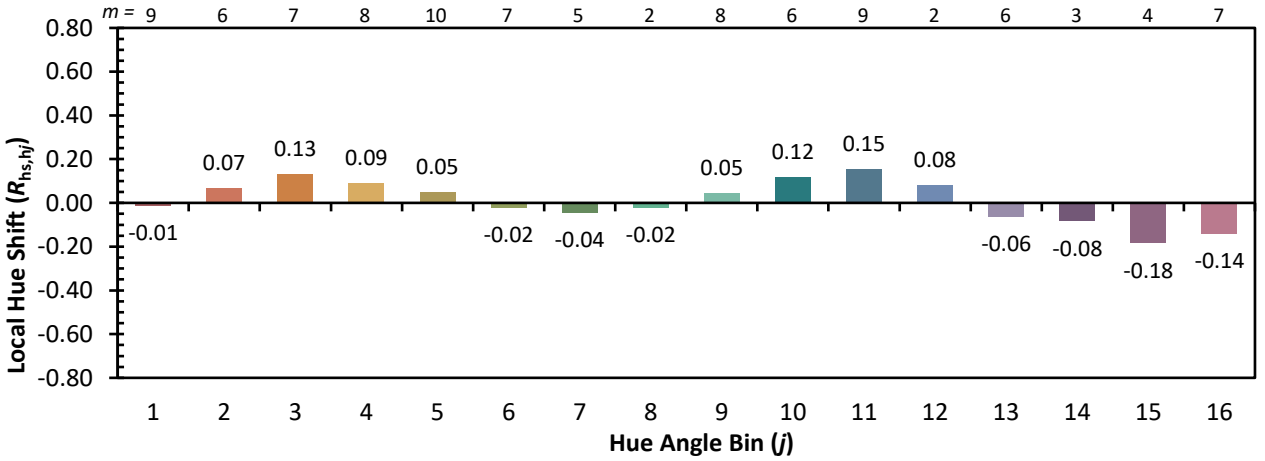
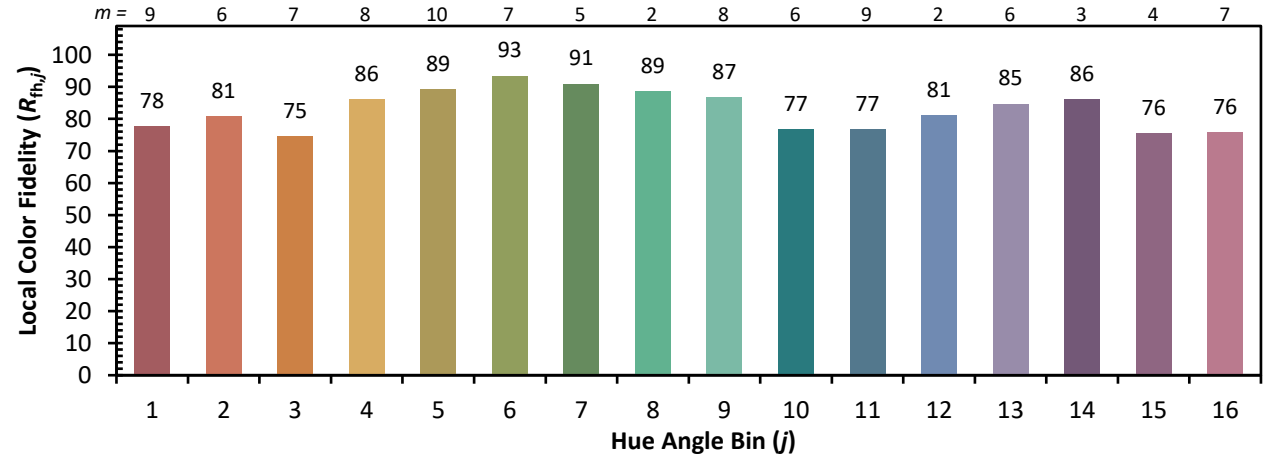
Color Rendition by Hue-Angle Bin







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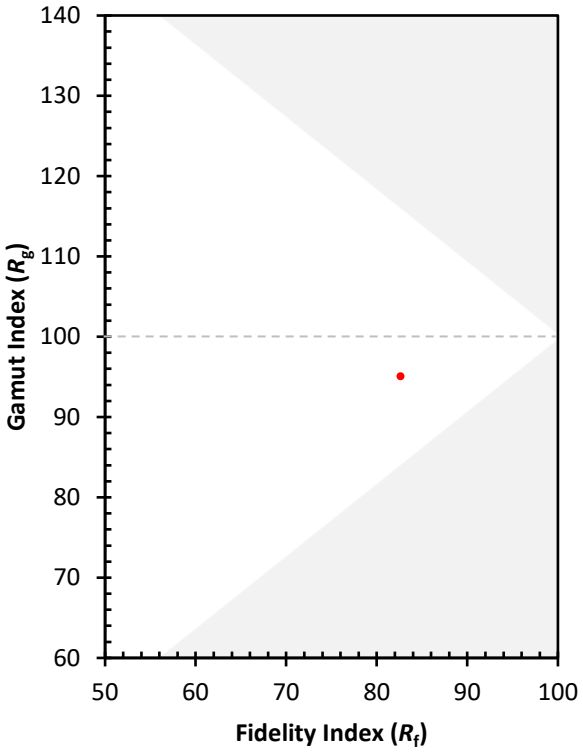
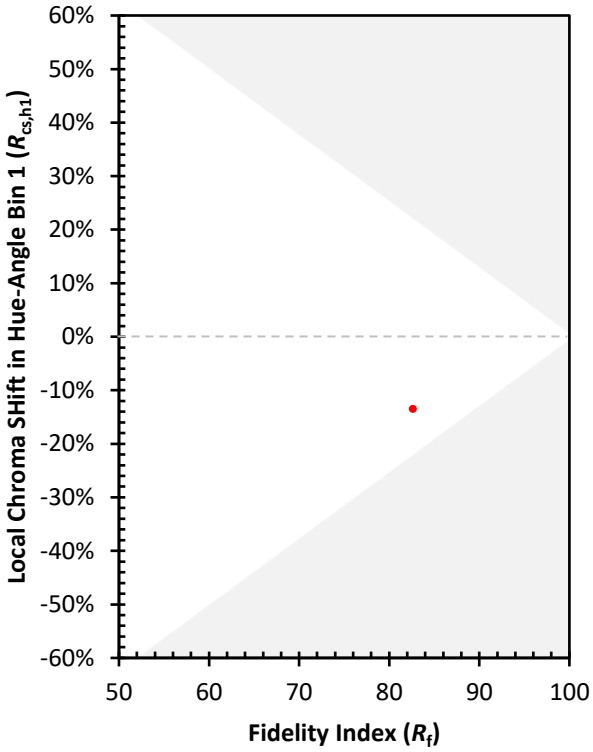
Measure Comparisons





(END OF REPORT)