

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: McGRAW-EDISON

Report Number: P232763

Luminaire Tested: **CTN-10-4-D-E1-T5N-7030**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P232763
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1707-171-22)
Test Lab: INNOVATION CENTER(G2)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: MCGRAW-EDISON
Catalog Number: CTN-10-4-D-E1-T5N-7030
Description: CELESTEON HIGH MAST LUMINAIRE
(10) 70 CRI, 3000K LEDS AND TYPE V NARROW OPTICS
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 46340 lumens
Efficiency: N/A
Efficacy: 150.5 lumens/watt
Luminous Opening: Circular (Dia: 2.08' x H: 0')
IES Classification: Type V - Short - Full Cutoff
BUG Rating: B5 - U0 - G3

Input Watts (W): 308
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT

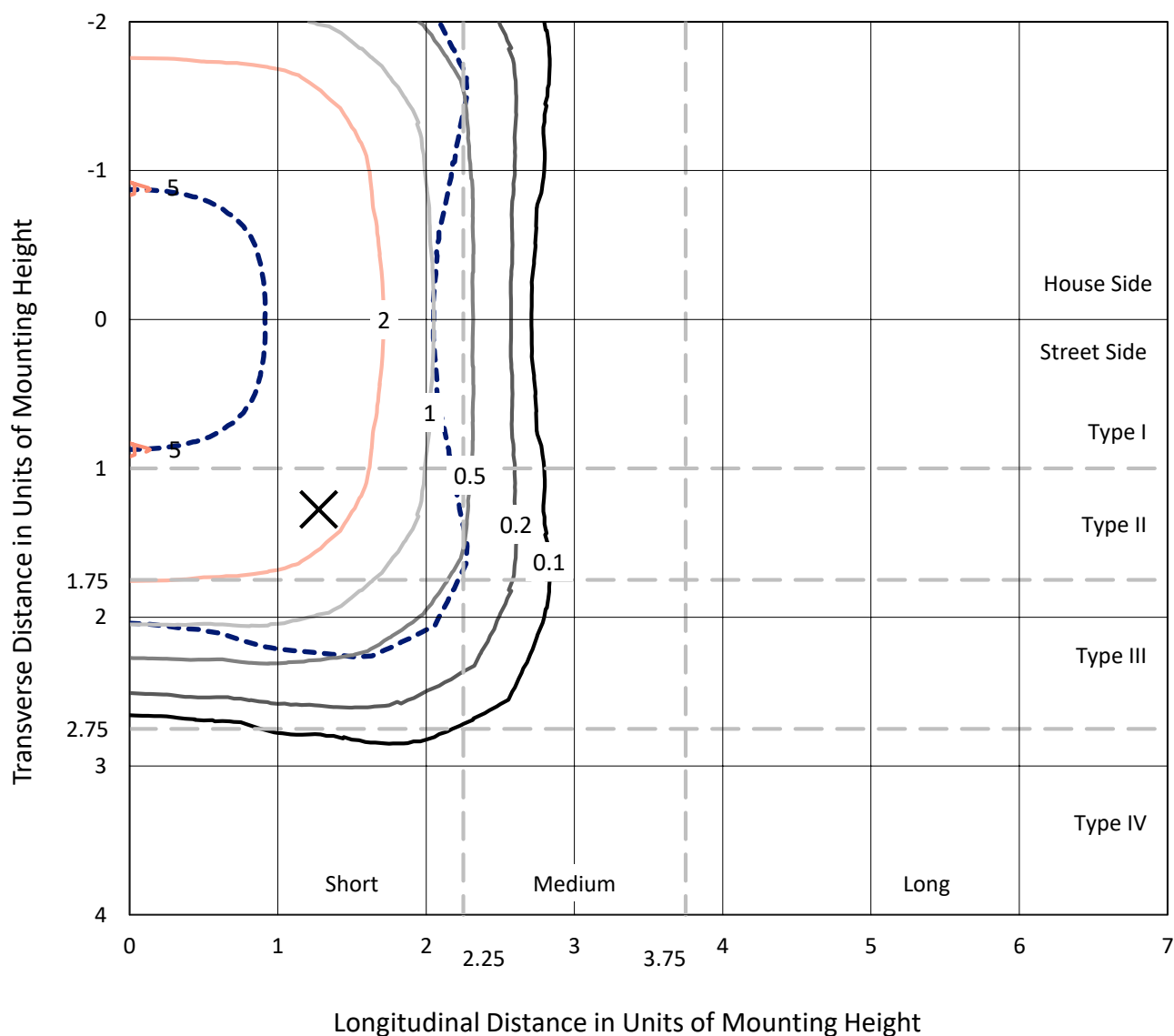


REPORT NUMBER: P232763

CATALOG NUMBER: CTN-10-4-D-E1-T5N-7030

Iso-Footcandle Lines of Horizontal Illumination

× Max cd
 --- 1/2 Max cd

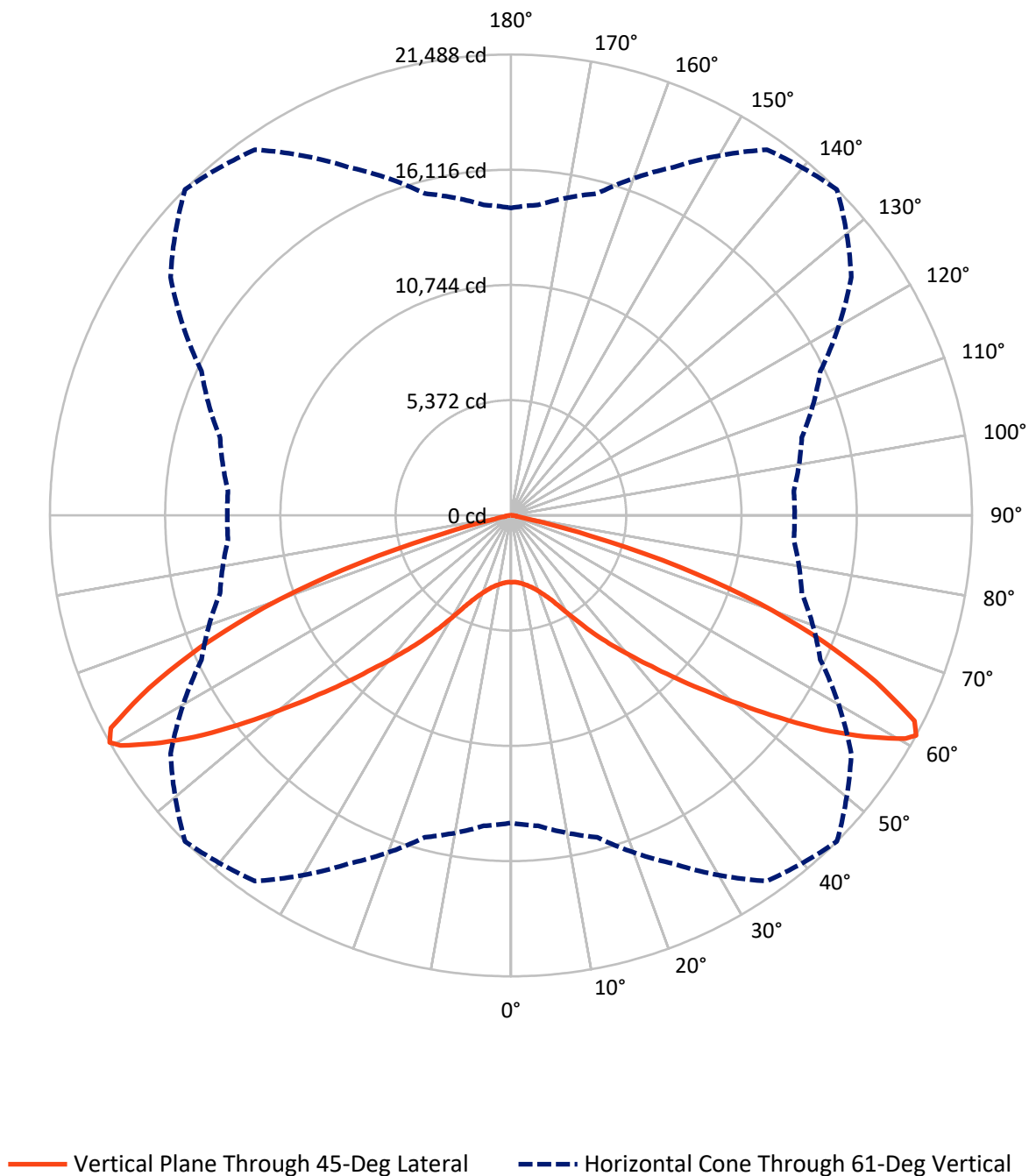


Based on 30 foot mounting height. Maximum calculated value = 5.1 fc
 Type V - Short - Full Cutoff

REPORT NUMBER: P232763

CATALOG NUMBER: CTN-10-4-D-E1-T5N-7030

Luminous Intensity Polar Plot



REPORT NUMBER: P232763

CATALOG NUMBER: CTN-10-4-D-E1-T5N-7030

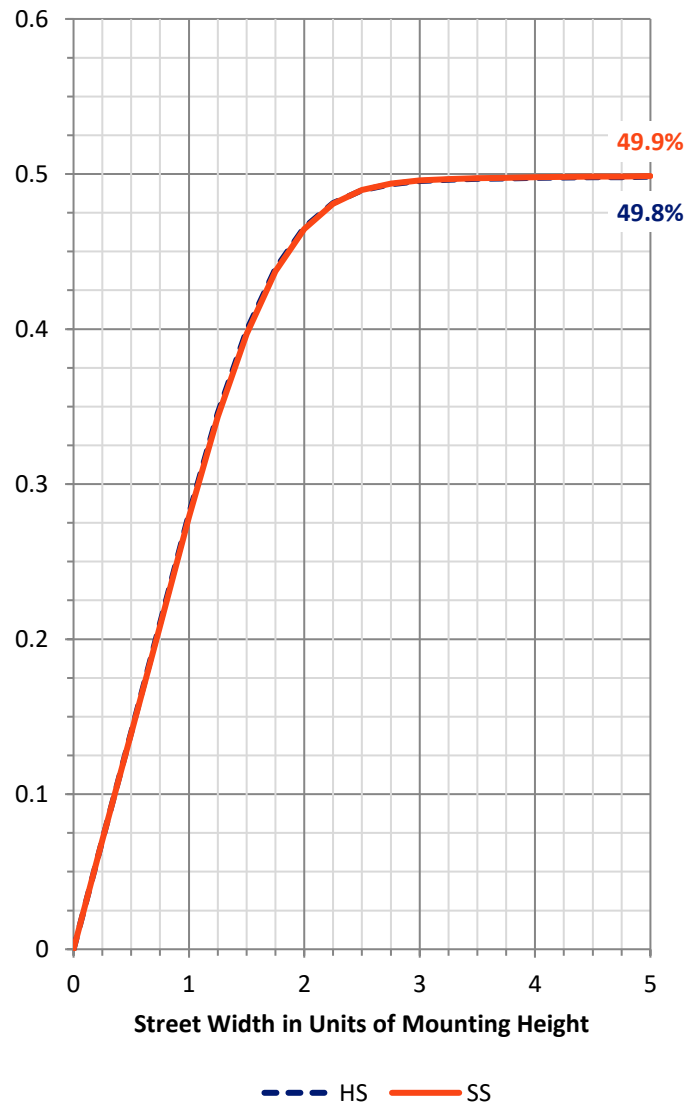
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	23170.0	0.0	23170.0
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	23170.0	0.0	23170.0
	% Fixture	50.0	0.0	50.0
Total	Lumens	46340.0	0.0	46340.0
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	304.8	0.7
10°-20°	998.6	2.2
20°-30°	2130.6	4.6
30°-40°	4640.6	10.0
40°-50°	8974.2	19.4
50°-60°	14251.3	30.8
60°-70°	12851.7	27.7
70°-80°	2011.6	4.3
80°-90°	176.8	0.4
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°	46340.0	100.0
0°-180°	46340.0	100.0

Coefficient of Utilization



REPORT NUMBER: P232763

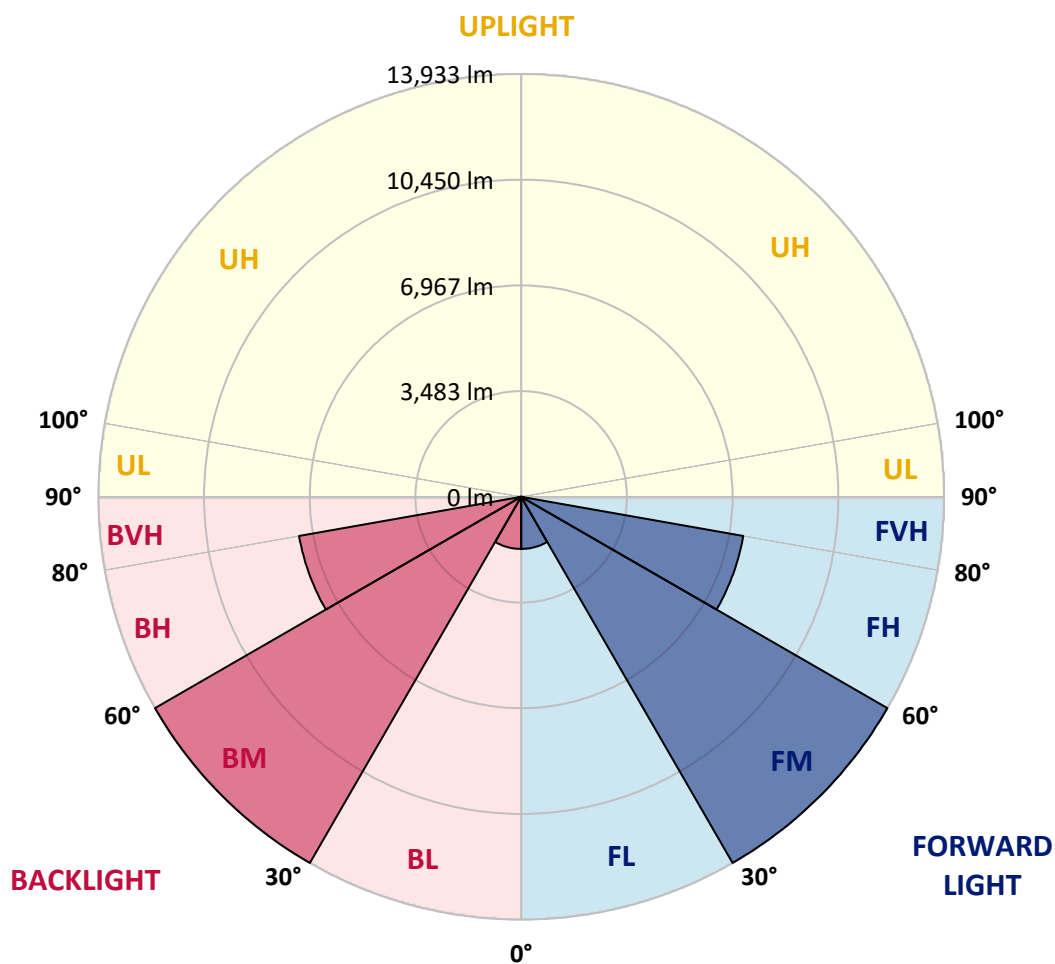
CATALOG NUMBER: CTN-10-4-D-E1-T5N-7030

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit		
				B	U	G
FL	(0°-30°)	1717.0	3.7			
FM	(30°-60°)	13933.0	30.1			
FH	(60°-80°)	7431.6	16.0			G3/7500
FVH	(80°-90°)	88.4	0.2			G1/100
BL	(0°-30°)	1717.0	3.7	B3/2500		
BM	(30°-60°)	13933.0	30.1	B5		
BH	(60°-80°)	7431.6	16.0	B5		G3/7500
BVH	(80°-90°)	88.4	0.2			G1/100
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B5-U0-G3

Type V Short



REPORT NUMBER: P232763

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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	3119.4	3119.4	3119.4	3119.4	3119.4	3119.4	3119.4	3119.4	3119.4	3119.4	3119.4
2.5°	3140.8	3134.1	3139.5	3143.5	3096.6	3108.6	3107.3	3139.5	3132.8	3147.6	3155.6
5°	3162.3	3151.6	3158.3	3169.0	3124.7	3140.8	3140.8	3170.4	3159.6	3174.4	3189.2
7.5°	3201.2	3190.5	3198.6	3212.0	3170.4	3187.8	3189.2	3224.1	3209.3	3221.4	3244.2
10°	3265.7	3259.0	3261.6	3273.7	3234.8	3256.3	3256.3	3293.9	3277.8	3291.2	3319.4
12.5°	3340.8	3338.2	3340.8	3356.9	3320.7	3342.2	3342.2	3378.4	3367.7	3383.8	3410.6
15°	3440.2	3437.5	3438.8	3460.3	3430.8	3450.9	3454.9	3492.5	3489.8	3507.3	3531.4
17.5°	3581.1	3581.1	3579.8	3598.5	3579.8	3599.9	3607.9	3648.2	3664.3	3685.8	3700.6
20°	3795.9	3783.8	3777.1	3786.5	3771.7	3793.2	3806.6	3872.4	3899.2	3932.8	3944.8
22.5°	4076.4	4060.3	4038.8	4029.4	4009.3	4037.5	4064.3	4158.3	4197.2	4252.2	4265.6
25°	4463.0	4436.1	4395.8	4358.3	4312.6	4352.9	4402.6	4531.4	4611.9	4684.4	4695.2
27.5°	4991.8	4951.5	4889.8	4817.3	4736.8	4786.4	4858.9	5046.8	5156.9	5272.3	5289.8
30°	5673.7	5666.9	5570.3	5441.4	5334.1	5362.3	5452.2	5684.4	5858.9	5978.3	6011.9
32.5°	6583.7	6577.0	6414.6	6197.1	6044.1	6062.9	6146.1	6403.8	6621.3	6815.9	6822.6
35°	7668.2	7646.8	7418.6	7117.9	6872.3	6850.8	6932.7	7189.0	7485.7	7712.5	7735.3
37.5°	8907.1	8872.2	8609.1	8154.1	7774.3	7685.7	7743.4	8065.5	8409.1	8665.5	8691.0
40°	10120.5	10093.7	9801.0	9374.2	8818.5	8594.4	8598.4	9010.5	9387.6	9625.2	9677.6
42.5°	11289.6	11311.1	11030.5	10595.7	10014.5	9614.5	9619.8	10019.8	10410.4	10657.4	10725.9
45°	12489.6	12470.8	12207.7	11834.5	11299.0	10856.0	10705.7	11105.7	11493.6	11696.3	11770.1
47.5°	13472.1	13438.5	13261.3	13064.0	12666.7	12230.5	11966.1	12243.9	12511.0	12647.9	12723.1
50°	14328.4	14301.6	14284.1	14200.9	14112.3	13830.5	13395.6	13378.1	13435.8	13465.4	13533.8
52.5°	15053.2	15051.9	15145.9	15349.9	15568.7	15666.6	14913.6	14426.4	14227.8	14081.5	14107.0
55°	15599.5	15592.8	15859.9	16406.2	17179.4	17622.3	16510.9	15333.8	14810.3	14527.1	14524.4
57.5°	15880.1	15892.1	16434.4	17423.6	18857.2	19461.2	18046.4	16167.3	15270.7	14839.8	14834.5
60°	15139.1	15190.1	16253.2	18054.5	20340.3	21129.6	19304.1	16340.4	14771.4	14047.9	14029.1
61°	14336.5	14528.4	15533.8	17910.9	20810.1	21487.9	19364.5	15910.9	14035.8	13237.2	13219.7
62.5°	12571.4	12751.3	14289.5	17552.5	20777.9	21112.1	19020.9	15139.1	12881.5	11991.6	11955.3
65°	9121.9	9333.9	10990.3	15551.2	18888.0	18689.4	17301.5	13367.4	10802.4	9801.0	9755.4
67.5°	4586.4	4857.6	6716.6	11285.6	15345.8	15723.0	14771.4	10583.6	7656.1	5781.0	5775.7
70°	1185.2	1300.6	2421.4	5935.4	11066.8	12315.1	11262.7	6131.4	2977.1	1795.9	1684.5
72.5°	331.5	347.6	657.7	2162.4	6293.8	8250.8	6105.9	2143.6	671.1	382.5	350.3
75°	233.6	237.6	261.7	547.6	2377.1	3850.9	1967.7	463.1	268.4	253.7	253.7
77.5°	208.0	210.7	226.8	295.3	498.0	865.7	377.2	299.3	236.2	228.2	225.5
80°	220.1	222.8	232.2	285.9	292.6	311.4	261.7	259.1	234.9	240.3	237.6
82.5°	236.2	241.6	253.7	292.6	251.0	252.3	214.8	213.4	208.0	236.2	237.6
85°	209.4	218.8	228.2	256.4	206.7	169.1	175.8	139.6	149.0	177.2	170.5
87.5°	116.8	115.4	111.4	116.8	104.7	84.6	71.1	64.4	59.1	67.1	65.8
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2104-215-6

Luminaire Tested: CST-CA6-230-730-U-T4

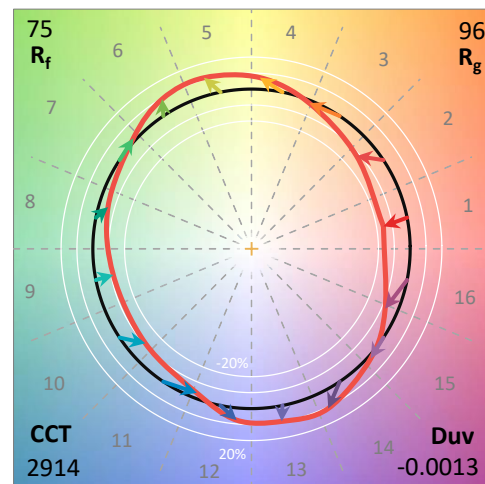
Test Date: 04/22/2021

Test Information

Test Method: LM-79-08
 Report Number: SP1-2104-215-6
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1
 Measurement Geometry: 4π
 Issue Date: 04/22/2021
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: STREETWORKS
 Catalog Number: **CST-CA6-230-730-U-T4**
 Description: STREETWORKS HIGH MAST LUMINAIRE

Spectral Parameters

CCT (K):	2914	CRI (Ra):	73.2		
CIE u':	0.2541	R1:	70.1	R9:	-27.2
CIE v':	0.5212	R2:	83.3	R10:	61.9
Duv:	-0.0013	R3:	94.2	R11:	65.4
CIE x:	0.4410	R4:	69.4	R12:	53.3
CIE y:	0.4020	R5:	69.3	R13:	72.6
CIE z:	0.1571	R6:	77.3	R14:	96.9
Peak Wavelength (nm):	599	R7:	77.5		
Dominant Wavelength (nm):	583	R8:	44.9		
Purity:	53.4				
Rf:	75.3				
Rg:	95.7				



Test Conditions

Stabilization Time: 72M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.6/15%
 Sphere Temperature (°C): 24.0

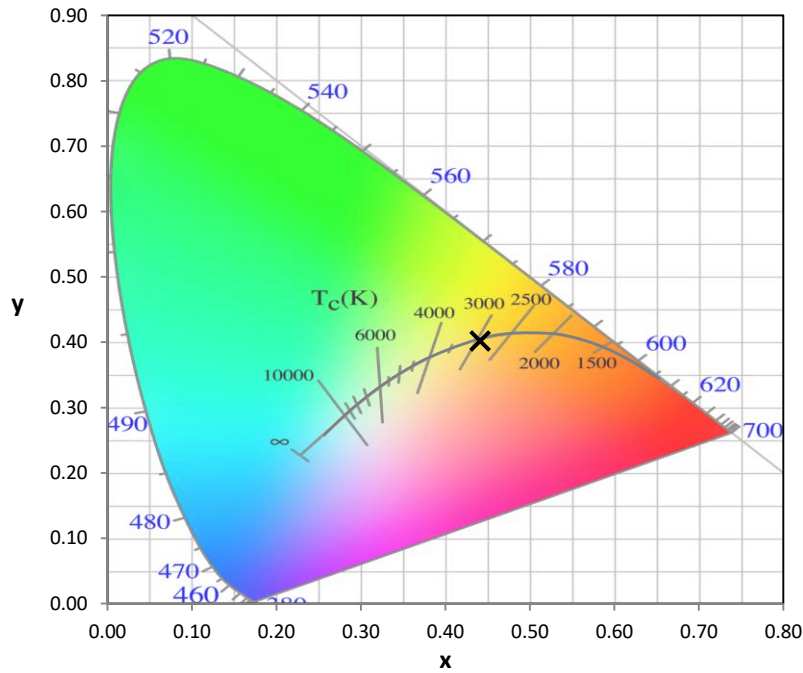
REPORT NUMBER: SP1-2104-215-6

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020	12/1/2021
Room Thermometer	IN0046	12/1/2020	12/1/2021

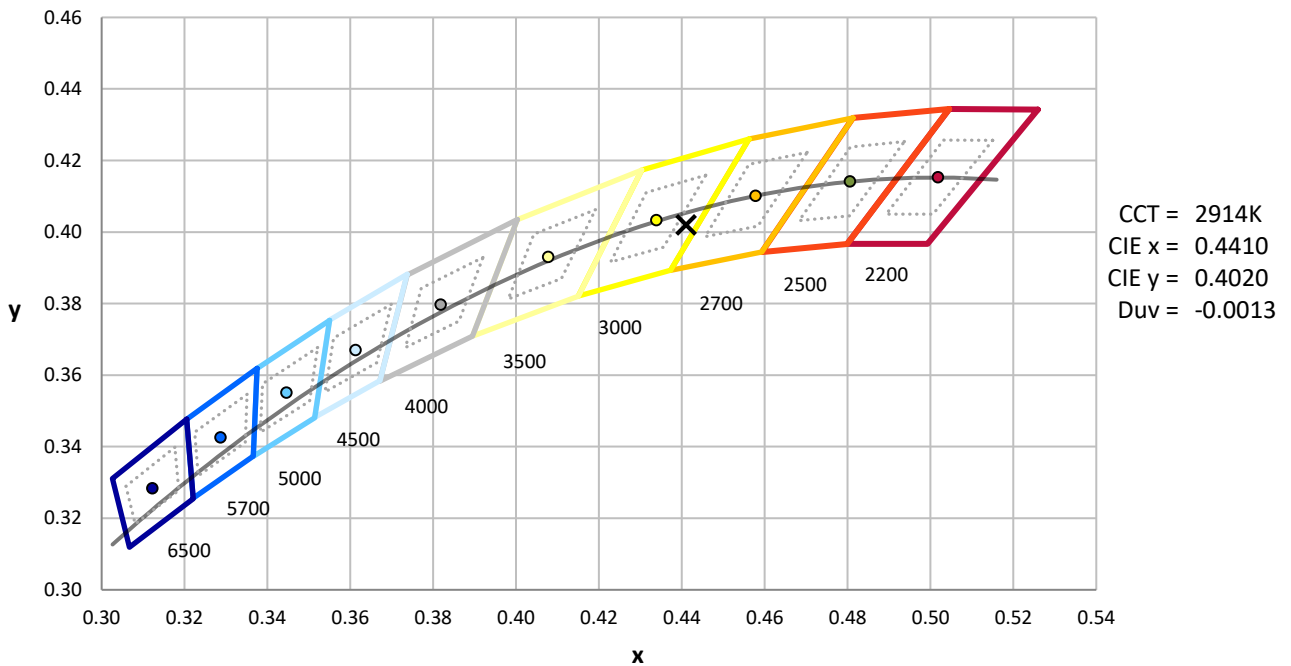


REPORT NUMBER: SP1-2104-215-6

CIE 1931 Chromaticity Diagram



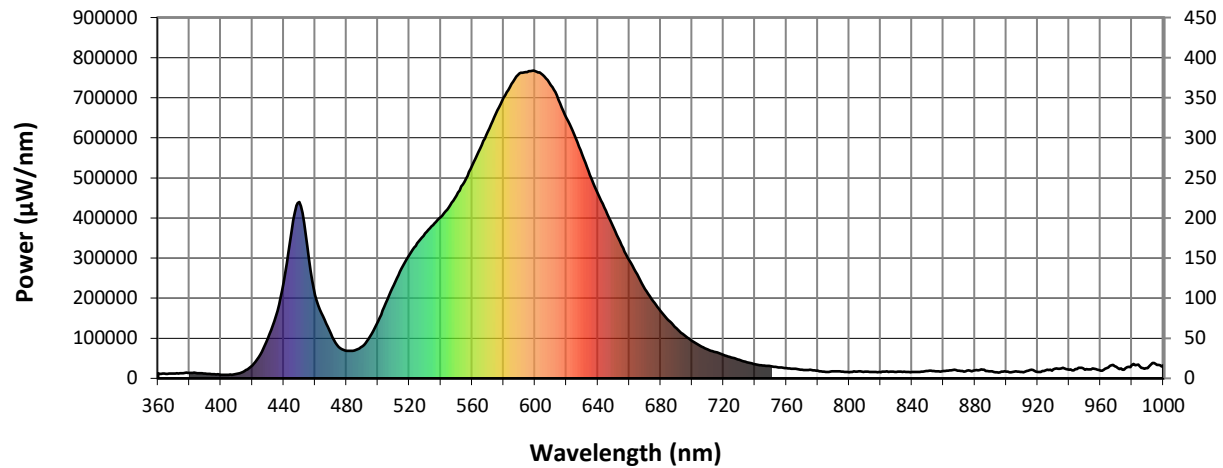
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 7-step quadrangle

REPORT NUMBER: SP1-2104-215-6

Photopic Flux vs. Wavelength

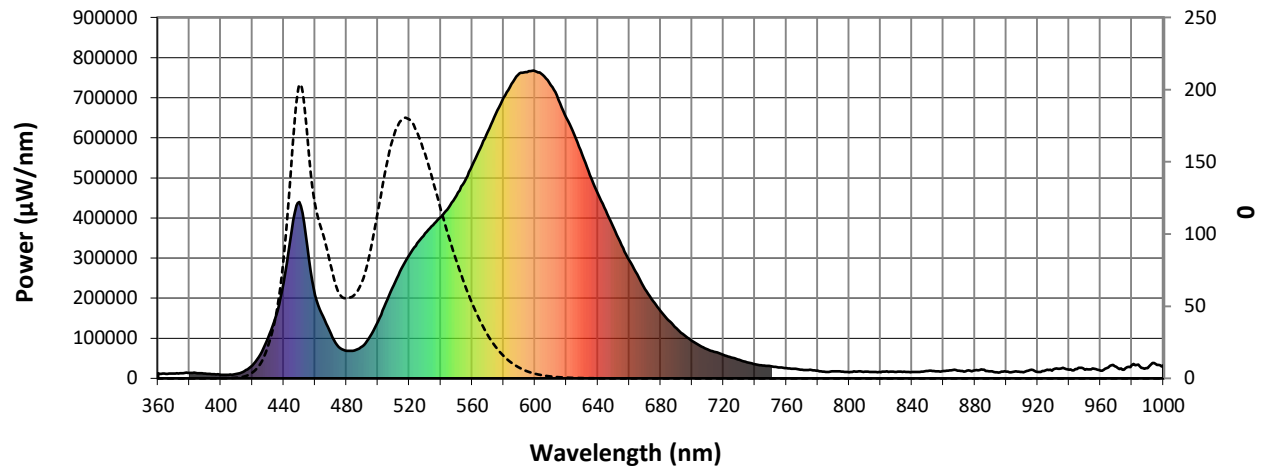


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λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)
360	12827	0.0	490	80096	11.4	620	649050	168.9	750	30187	0.0	880	19756	0.0
365	11336	0.0	495	104447	18.9	625	608162	134.2	755	27442	0.0	885	21245	0.0
370	11776	0.0	500	142477	31.4	630	557990	101.0	760	25382	0.0	890	17771	0.0
375	13009	0.0	505	187724	52.5	635	506861	76.2	765	23778	0.0	895	14356	0.0
380	13906	0.0	510	232209	79.8	640	460827	55.1	770	21474	0.0	900	16683	0.0
385	12960	0.0	515	273388	113.2	645	418064	40.3	775	21394	0.0	905	16548	0.0
390	11750	0.0	520	308378	149.5	650	376246	27.5	780	18945	0.0	910	15630	0.0
395	10399	0.0	525	336804	180.8	655	332016	19.0	785	16318	0.0	915	20907	0.0
400	9192	0.0	530	361609	212.9	660	294638	12.3	790	17841	0.0	920	16083	0.0
405	8943	0.0	535	382440	237.2	665	259105	8.2	795	16506	0.0	925	20203	0.0
410	11120	0.0	540	401976	261.9	670	223041	4.9	800	15058	0.0	930	22625	0.0
415	18193	0.0	545	426232	283.7	675	193569	3.2	805	16851	0.0	935	24828	0.0
420	32317	0.1	550	455969	309.9	680	167520	1.9	810	16679	0.0	940	21275	0.0
425	59220	0.3	555	490448	335.0	685	144697	1.2	815	15851	0.0	945	23270	0.0
430	100522	0.8	560	530799	360.7	690	125032	0.7	820	15536	0.0	950	21756	0.0
435	155311	1.8	565	572799	380.9	695	107458	0.5	825	16381	0.0	955	24823	0.0
440	239817	3.8	570	615361	400.1	700	93549	0.3	830	16149	0.0	960	19499	0.0
445	368265	7.7	575	659689	410.5	705	81608	0.2	835	16687	0.0	965	27077	0.0
450	439895	11.4	580	700037	416.0	710	71559	0.1	840	16206	0.0	970	28727	0.0
455	329010	11.0	585	734518	408.1	715	65193	0.1	845	16062	0.0	975	21725	0.0
460	207545	8.5	590	760906	393.4	720	58466	0.0	850	18530	0.0	980	33536	0.0
465	154577	8.0	595	763605	362.0	725	52265	0.0	855	17709	0.0	985	30537	0.0
470	110708	6.9	600	766048	330.1	730	46287	0.0	860	18086	0.0	990	25187	0.0
475	78445	6.2	605	756483	293.0	735	40164	0.0	865	19763	0.0	995	35676	0.0
480	68887	6.5	610	730981	251.1	740	35097	0.0	870	19416	0.0	1000	32909	0.0
485	69832	8.3	615	694682	209.7	745	32334	0.0	875	19352	0.0			

REPORT NUMBER: SP1-2104-215-6

Scotopic Flux vs. Wavelength



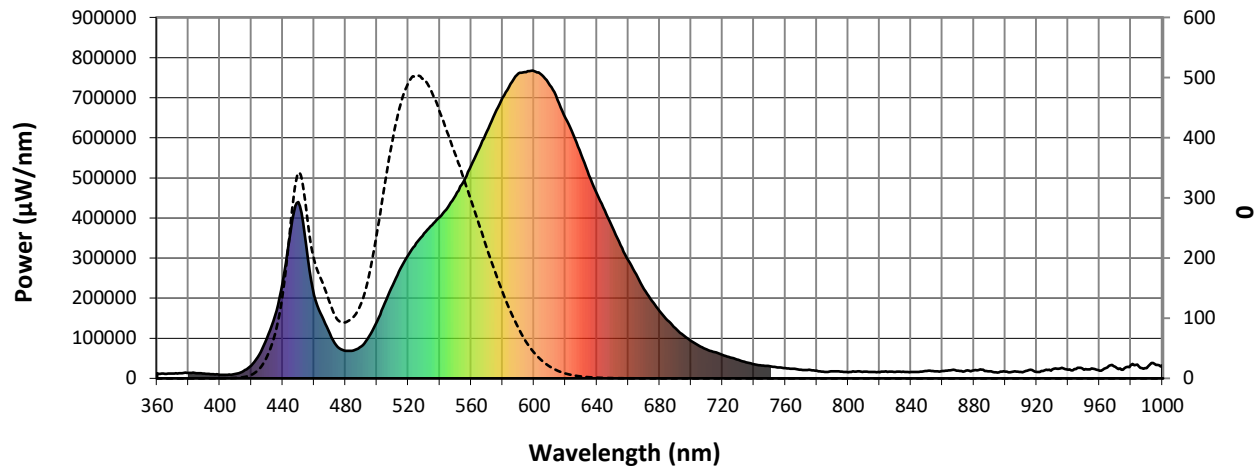
Scotopic Lumens: 43125.2

S/P: 1.19

λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (Φ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (Φ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (Φ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (Φ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (Φ/nm)
360	12827	0.0	490	80096	123.3	620	649050	8.1	750	30187	0.0	880	19756	0.0
365	11336	0.0	495	104447	168.8	625	608162	5.1	755	27442	0.0	885	21245	0.0
370	11776	0.0	500	142477	238.3	630	557990	3.2	760	25382	0.0	890	17771	0.0
375	13009	0.0	505	187724	319.1	635	506861	1.9	765	23778	0.0	895	14356	0.0
380	13906	0.0	510	232209	393.6	640	460827	1.2	770	21474	0.0	900	16683	0.0
385	12960	0.0	515	273388	453.1	645	418064	0.7	775	21394	0.0	905	16548	0.0
390	11750	0.0	520	308378	490.2	650	376246	0.4	780	18945	0.0	910	15630	0.0
395	10399	0.1	525	336804	503.9	655	332016	0.3	785	16318	0.0	915	20907	0.0
400	9192	0.1	530	361609	498.6	660	294638	0.2	790	17841	0.0	920	16083	0.0
405	8943	0.3	535	382440	476.6	665	259105	0.1	795	16506	0.0	925	20203	0.0
410	11120	0.7	540	401976	444.2	670	223041	0.1	800	15058	0.0	930	22625	0.0
415	18193	1.9	545	426232	408.7	675	193569	0.0	805	16851	0.0	935	24828	0.0
420	32317	5.3	550	455969	372.8	680	167520	0.0	810	16679	0.0	940	21275	0.0
425	59220	14.5	555	490448	335.2	685	144697	0.0	815	15851	0.0	945	23270	0.0
430	100522	34.2	560	530799	296.7	690	125032	0.0	820	15536	0.0	950	21756	0.0
435	155311	69.4	565	572799	257.0	695	107458	0.0	825	16381	0.0	955	24823	0.0
440	239817	134.0	570	615361	217.2	700	93549	0.0	830	16149	0.0	960	19499	0.0
445	368265	246.6	575	659689	179.7	705	81608	0.0	835	16687	0.0	965	27077	0.0
450	439895	340.9	580	700037	144.2	710	71559	0.0	840	16206	0.0	970	28727	0.0
455	329010	287.5	585	734518	112.3	715	65193	0.0	845	16062	0.0	975	21725	0.0
460	207545	200.5	590	760906	84.7	720	58466	0.0	850	18530	0.0	980	33536	0.0
465	154577	163.3	595	763605	60.9	725	52265	0.0	855	17709	0.0	985	30537	0.0
470	110708	127.5	600	766048	43.2	730	46287	0.0	860	18086	0.0	990	25187	0.0
475	78445	98.1	605	756483	29.7	735	40164	0.0	865	19763	0.0	995	35676	0.0
480	68887	93.1	610	730981	19.8	740	35097	0.0	870	19416	0.0	1000	32909	0.0
485	69832	101.2	615	694682	12.8	745	32334	0.0	875	19352	0.0			

REPORT NUMBER: SP1-2104-215-6

Melanopic Flux vs. Wavelength



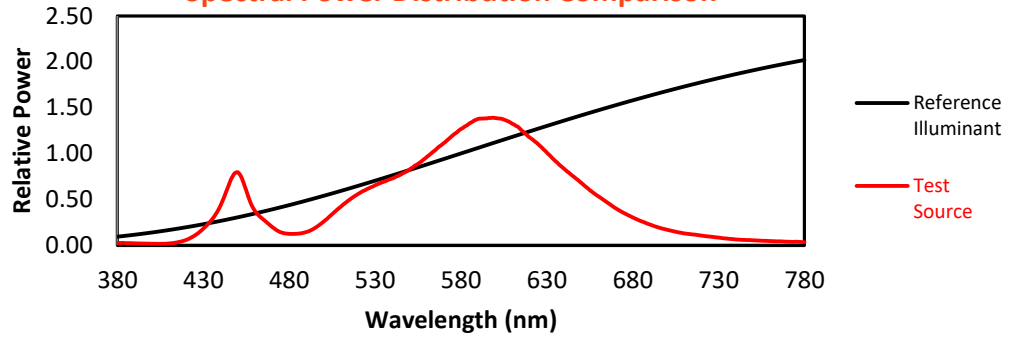
Melanopic Lumens: 15555.2 **M/P: 0.43**

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	12827	0.0	490	80096	66.7	620	649050	0.5	750	30187	0.0	880	19756	0.0
365	11336	0.0	495	104447	86.2	625	608162	0.3	755	27442	0.0	885	21245	0.0
370	11776	0.0	500	142477	114.5	630	557990	0.2	760	25382	0.0	890	17771	0.0
375	13009	0.0	505	187724	144.1	635	506861	0.1	765	23778	0.0	895	14356	0.0
380	13906	0.0	510	232209	166.7	640	460827	0.1	770	21474	0.0	900	16683	0.0
385	12960	0.0	515	273388	178.6	645	418064	0.0	775	21394	0.0	905	16548	0.0
390	11750	0.0	520	308378	179.5	650	376246	0.0	780	18945	0.0	910	15630	0.0
395	10399	0.1	525	336804	170.8	655	332016	0.0	785	16318	0.0	915	20907	0.0
400	9192	0.1	530	361609	156.3	660	294638	0.0	790	17841	0.0	920	16083	0.0
405	8943	0.2	535	382440	137.6	665	259105	0.0	795	16506	0.0	925	20203	0.0
410	11120	0.4	540	401976	117.6	670	223041	0.0	800	15058	0.0	930	22625	0.0
415	18193	1.2	545	426232	99.0	675	193569	0.0	805	16851	0.0	935	24828	0.0
420	32317	3.7	550	455969	81.9	680	167520	0.0	810	16679	0.0	940	21275	0.0
425	59220	9.2	555	490448	66.1	685	144697	0.0	815	15851	0.0	945	23270	0.0
430	100522	21.2	560	530799	52.4	690	125032	0.0	820	15536	0.0	950	21756	0.0
435	155311	41.4	565	572799	40.2	695	107458	0.0	825	16381	0.0	955	24823	0.0
440	239817	80.1	570	615361	30.1	700	93549	0.0	830	16149	0.0	960	19499	0.0
445	368265	145.3	575	659689	22.0	705	81608	0.0	835	16687	0.0	965	27077	0.0
450	439895	202.7	580	700037	15.7	710	71559	0.0	840	16206	0.0	970	28727	0.0
455	329010	172.4	585	734518	10.9	715	65193	0.0	845	16062	0.0	975	21725	0.0
460	207545	122.3	590	760906	7.5	720	58466	0.0	850	18530	0.0	980	33536	0.0
465	154577	101.0	595	763605	4.9	725	52265	0.0	855	17709	0.0	985	30537	0.0
470	110708	79.3	600	766048	3.2	730	46287	0.0	860	18086	0.0	990	25187	0.0
475	78445	59.9	605	756483	2.1	735	40164	0.0	865	19763	0.0	995	35676	0.0
480	68887	55.4	610	730981	1.3	740	35097	0.0	870	19416	0.0	1000	32909	0.0
485	69832	57.6	615	694682	0.8	745	32334	0.0	875	19352	0.0			

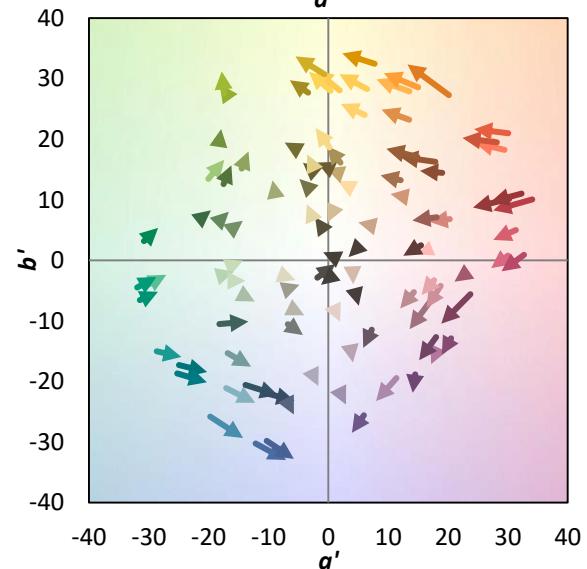
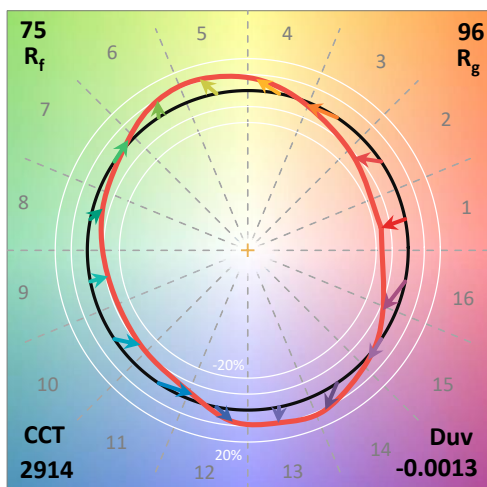
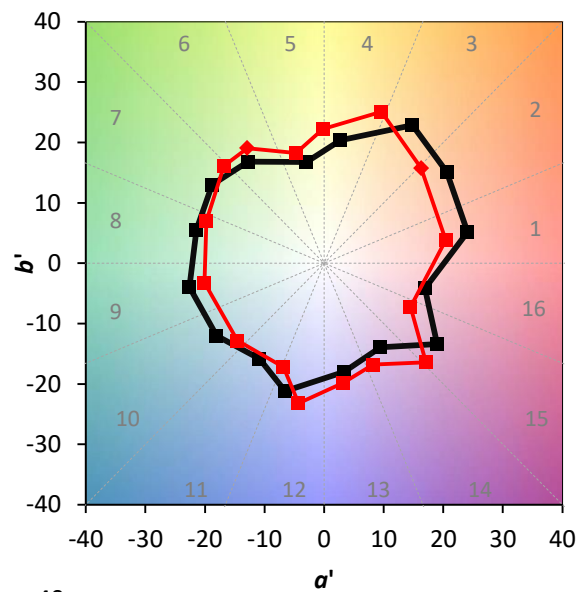
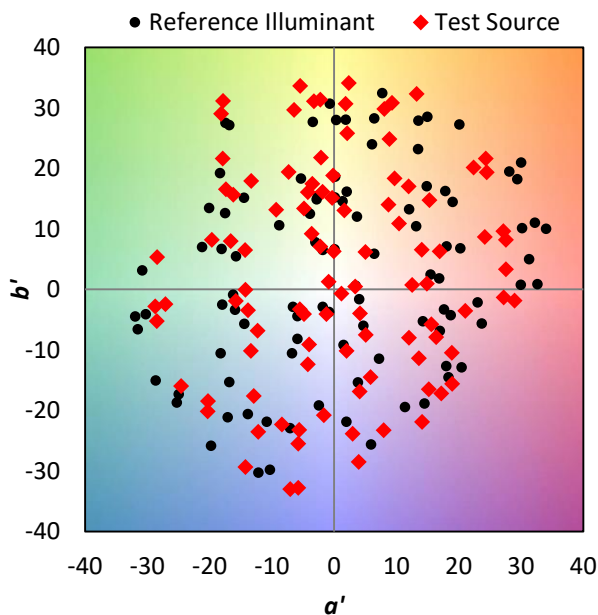
Summary

$R_f = 75.3$
 $R_g = 95.7$
 CIE $R_a = 73.2$
 $R_g = -27.2$

Spectral Power Distribution Comparison

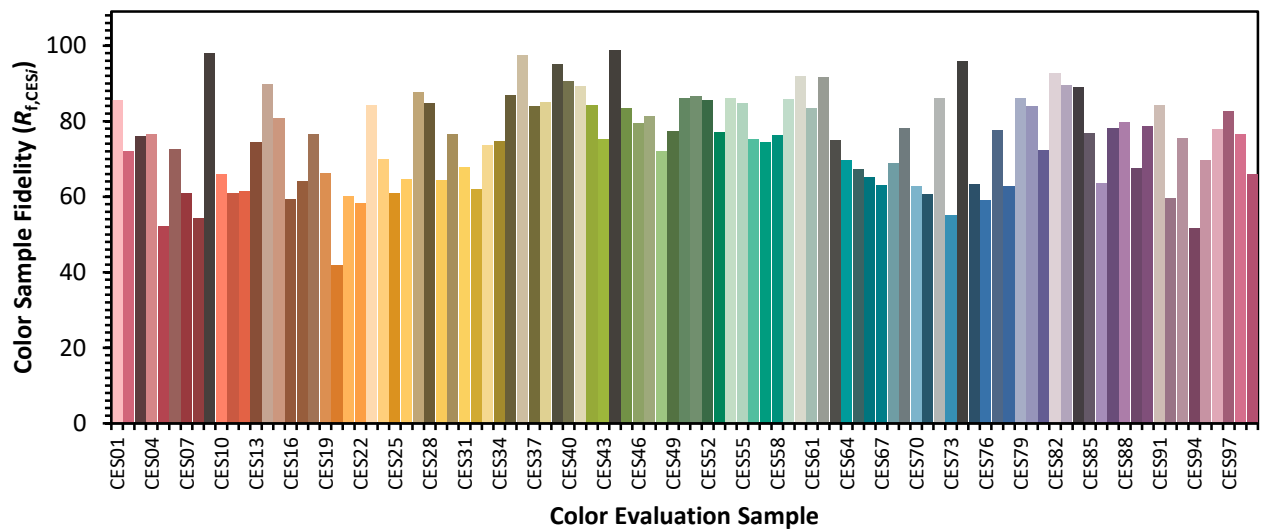


Color Vector Graphics

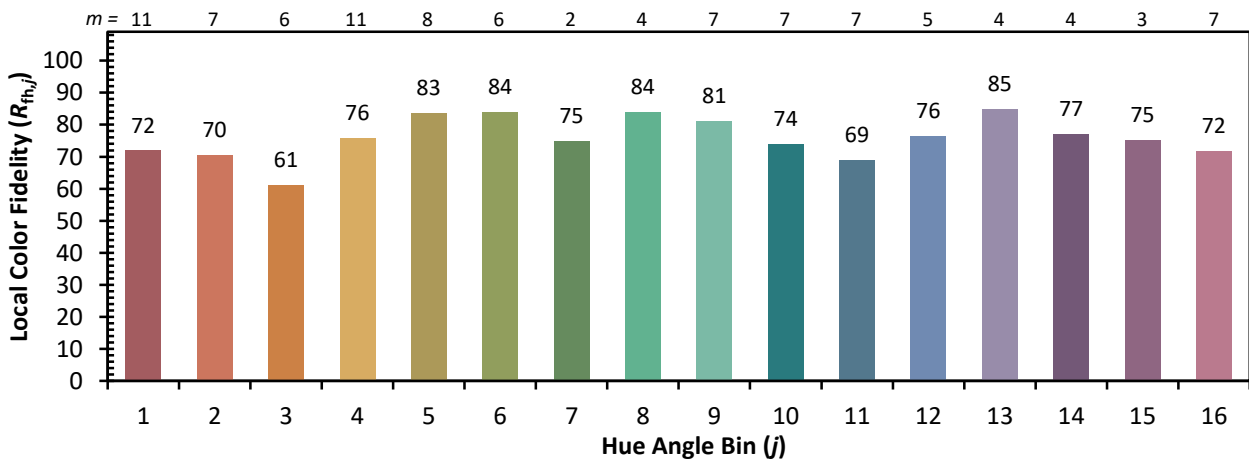
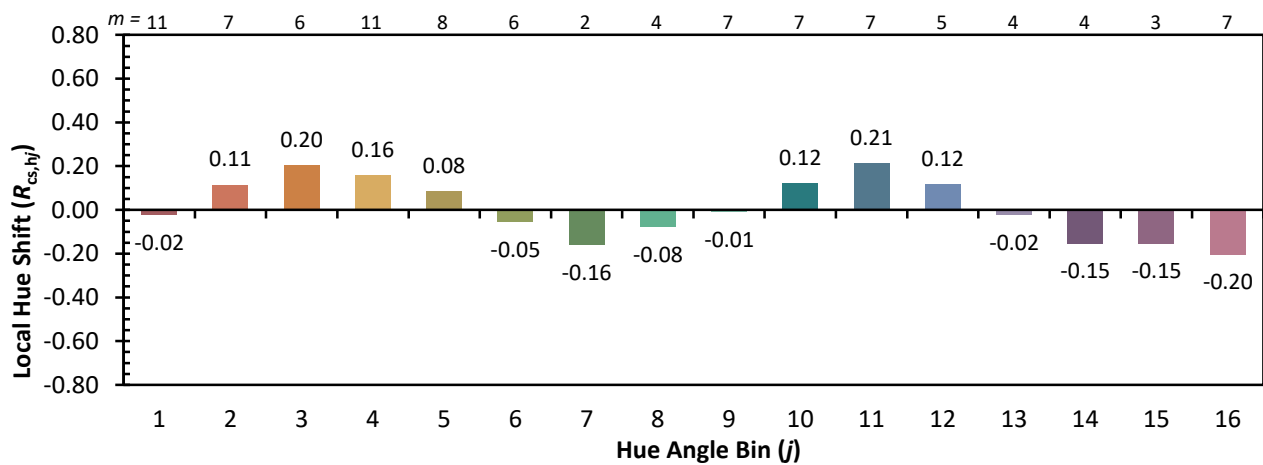
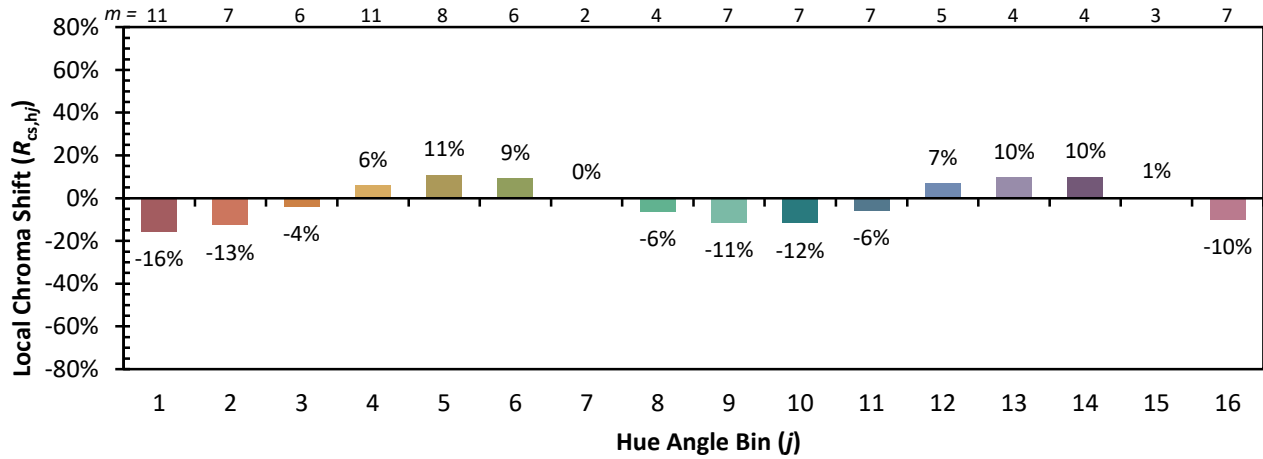


Individual Sample Fidelity Index ($R_{f,i}$)

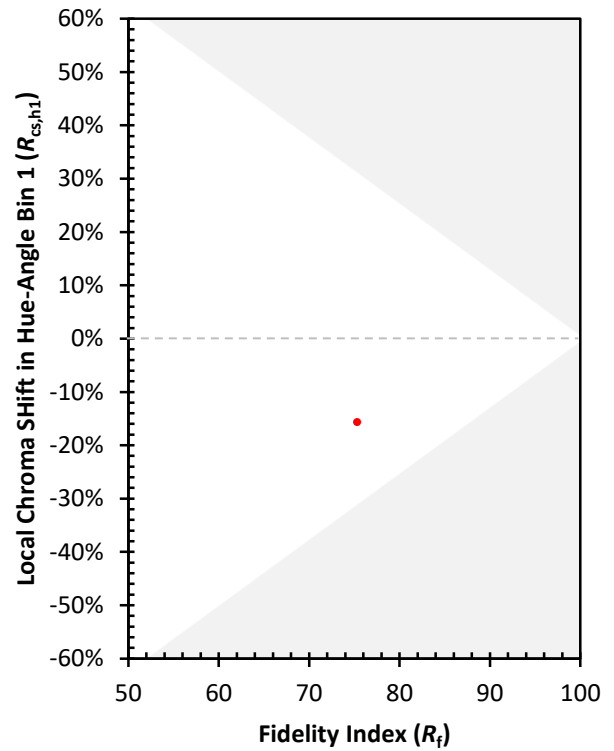
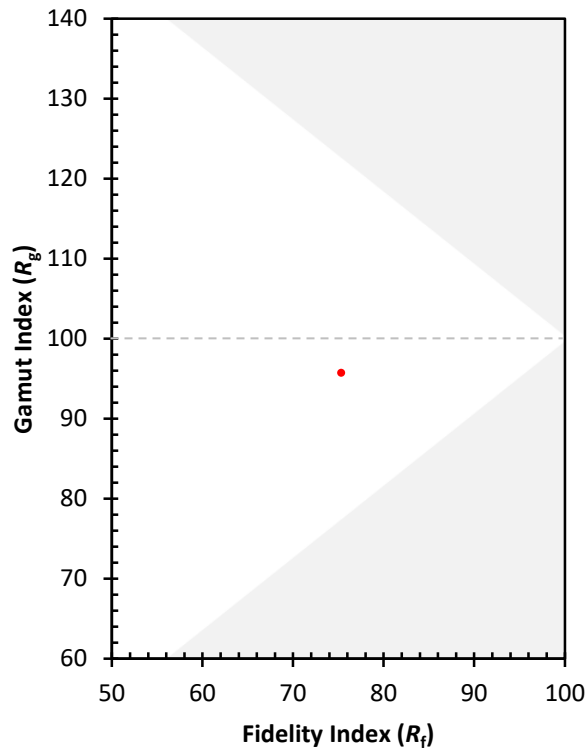
CES01 = 86	CES26 = 65	CES51 = 87	CES76 = 59
CES02 = 63	CES27 = 88	CES52 = 86	CES77 = 78
CES03 = 31	CES28 = 85	CES53 = 77	CES78 = 63
CES04 = 71	CES29 = 64	CES54 = 86	CES79 = 86
CES05 = 49	CES30 = 77	CES55 = 85	CES80 = 84
CES06 = 51	CES31 = 68	CES56 = 75	CES81 = 72
CES07 = 42	CES32 = 62	CES57 = 75	CES82 = 93
CES08 = 40	CES33 = 74	CES58 = 76	CES83 = 89
CES09 = 29	CES34 = 75	CES59 = 86	CES84 = 89
CES10 = 76	CES35 = 87	CES60 = 92	CES85 = 77
CES11 = 59	CES36 = 98	CES61 = 84	CES86 = 64
CES12 = 65	CES37 = 84	CES62 = 92	CES87 = 78
CES13 = 43	CES38 = 85	CES63 = 75	CES88 = 80
CES14 = 74	CES39 = 95	CES64 = 70	CES89 = 67
CES15 = 71	CES40 = 90	CES65 = 67	CES90 = 79
CES16 = 47	CES41 = 89	CES66 = 65	CES91 = 84
CES17 = 50	CES42 = 84	CES67 = 63	CES92 = 60
CES18 = 56	CES43 = 75	CES68 = 69	CES93 = 75
CES19 = 73	CES44 = 99	CES69 = 78	CES94 = 52
CES20 = 66	CES45 = 83	CES70 = 63	CES95 = 70
CES21 = 87	CES46 = 80	CES71 = 61	CES96 = 78
CES22 = 79	CES47 = 81	CES72 = 86	CES97 = 83
CES23 = 92	CES48 = 72	CES73 = 55	CES98 = 77
CES24 = 91	CES49 = 77	CES74 = 96	CES99 = 66
CES25 = 73	CES50 = 86	CES75 = 63	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)