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: P879652

Luminaire Tested: **EMM2-HTN-VA9-727-U-WQ**

Issue Date: 10/01/2024

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:	P879652
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	10/01/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HTN-VA9-727-U-WQ
Description:	EPIC MODERN TALL HOUSING 9W 70CRI 2700K WAVESTREAM FIXTURE w/ TYPE V WIDE DISTRIBUTION OPTIC
Light Source:	(1) 2700K CCT, 70 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	16975.2 lumens
Efficiency:	N/A
Efficacy:	99.9 lumens/watt
Luminous Opening:	Circular (Dia: 1.12' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B4 - U0 - G3

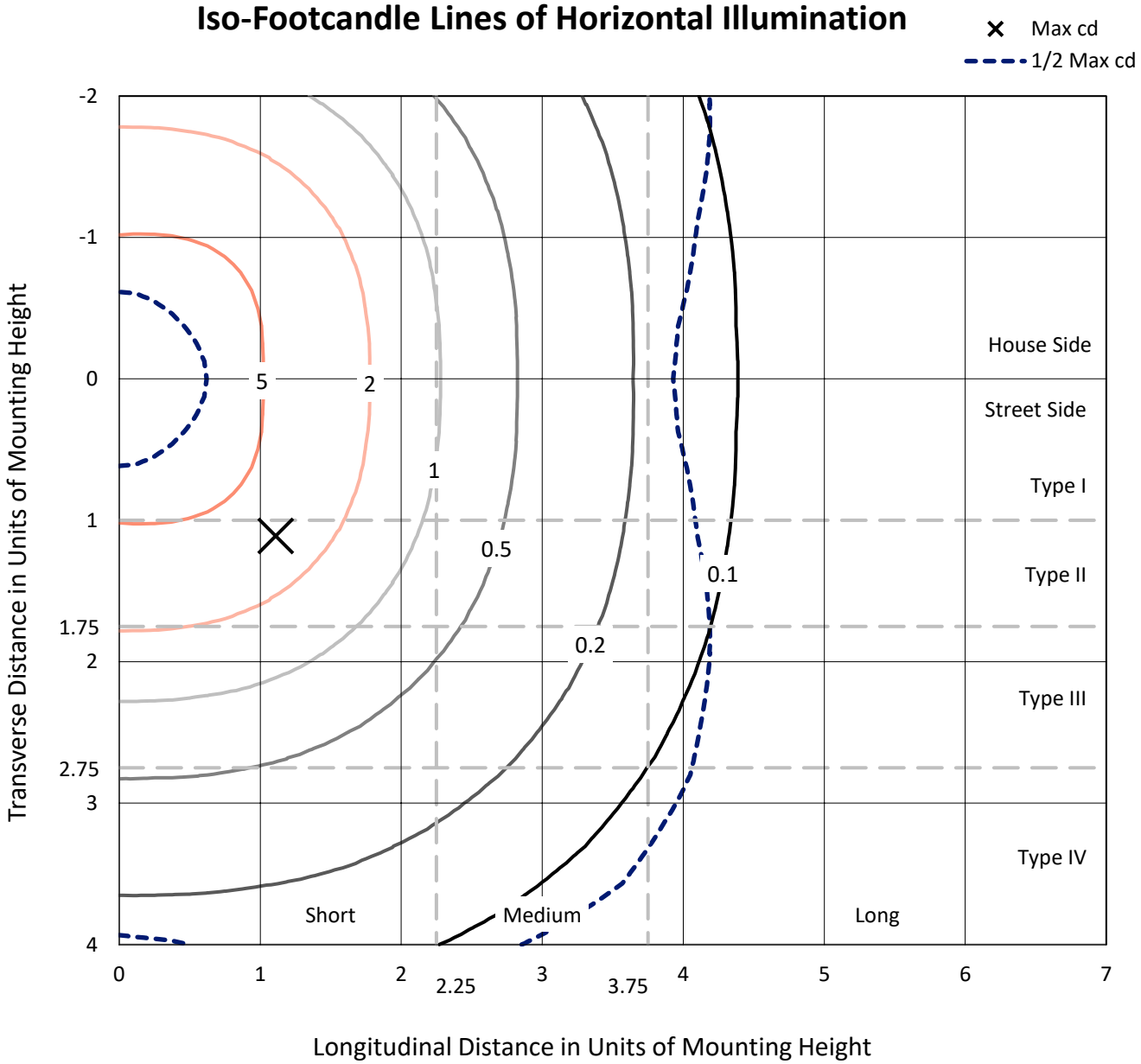
Input Watts (W):	170
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.995
Total Harmonic Distortion (THDi):	5.9%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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

Scaled Data Report

REPORT NUMBER: P879652
CATALOG NUMBER: EMM2-HTN-VA9-727-U-WQ

Iso-Footcandle Lines of Horizontal Illumination



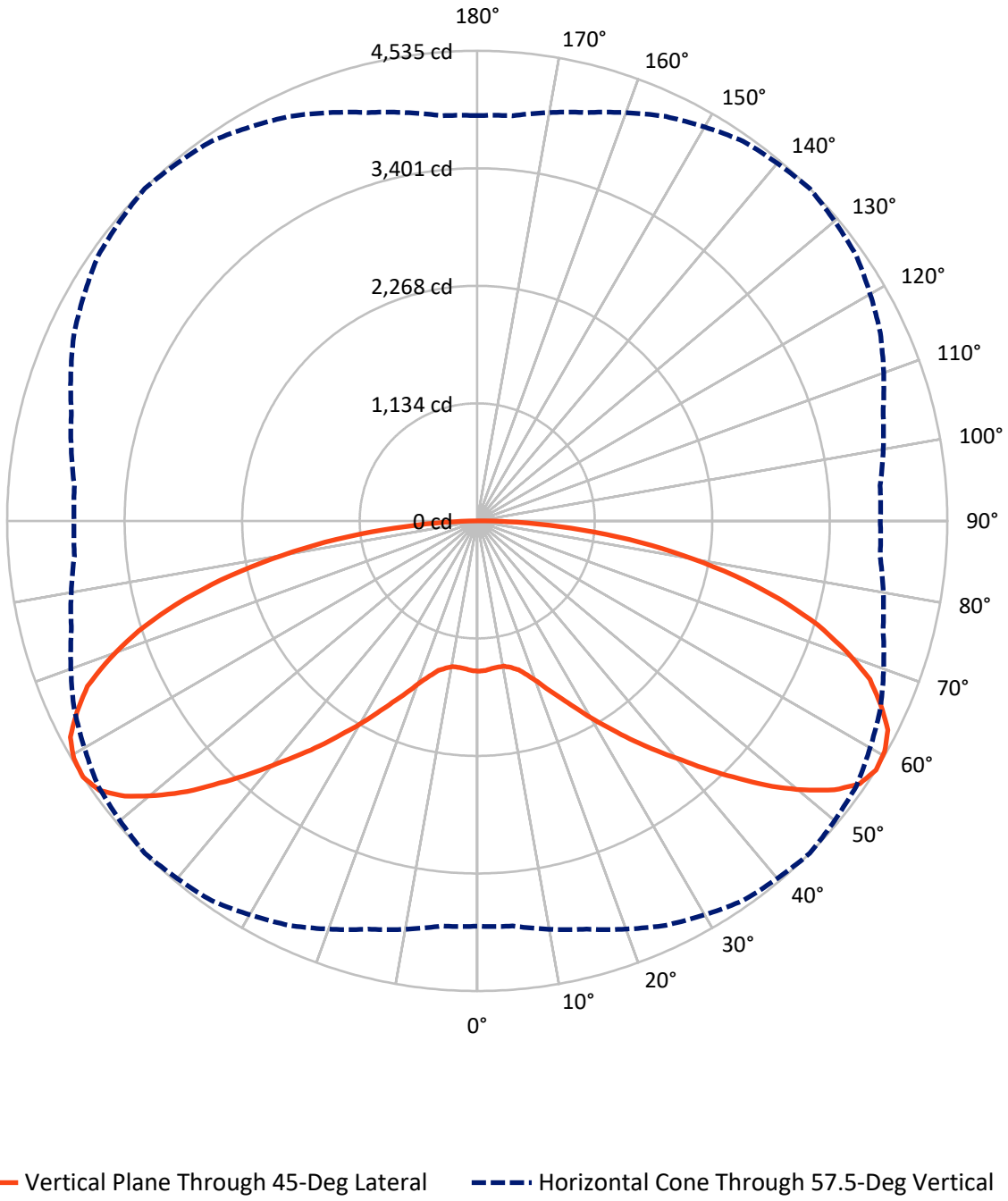
Based on 15 foot mounting height. Maximum calculated value = 6.4 fc
Type V - Short - N/A

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

Scaled Data Report

REPORT NUMBER: P879652
CATALOG NUMBER: EMM2-HTN-VA9-727-U-WQ

Luminous Intensity Polar Plot



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

Scaled Data Report

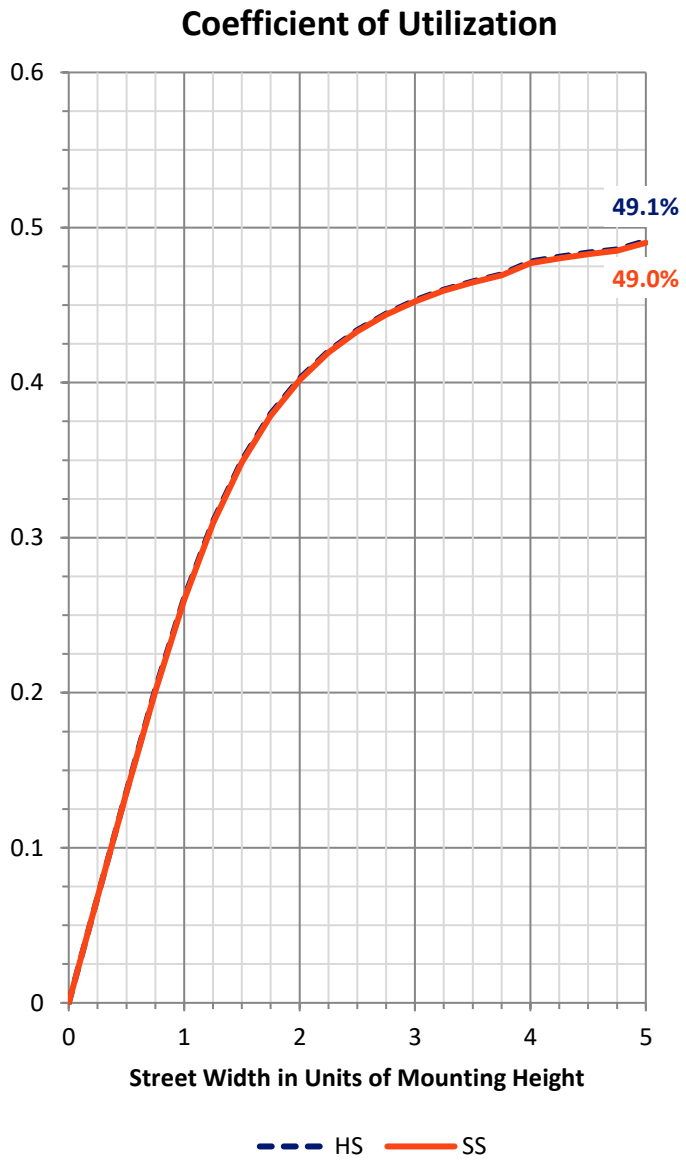
REPORT NUMBER: P879652
CATALOG NUMBER: EMM2-HTN-VA9-727-U-WQ

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	8487.6	0.0	8487.6
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	8487.6	0.0	8487.6
	% Fixture	50.0	0.0	50.0
Total	Lumens	16975.2	0.0	16975.2
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	136.5	0.8
10°-20°	429.1	2.5
20°-30°	882.0	5.2
30°-40°	1609.4	9.5
40°-50°	2639.3	15.5
50°-60°	3698.3	21.8
60°-70°	3868.9	22.8
70°-80°	2826.7	16.7
80°-90°	884.8	5.2
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°	16975.2	100.0
0°-180°	16975.2	100.0



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

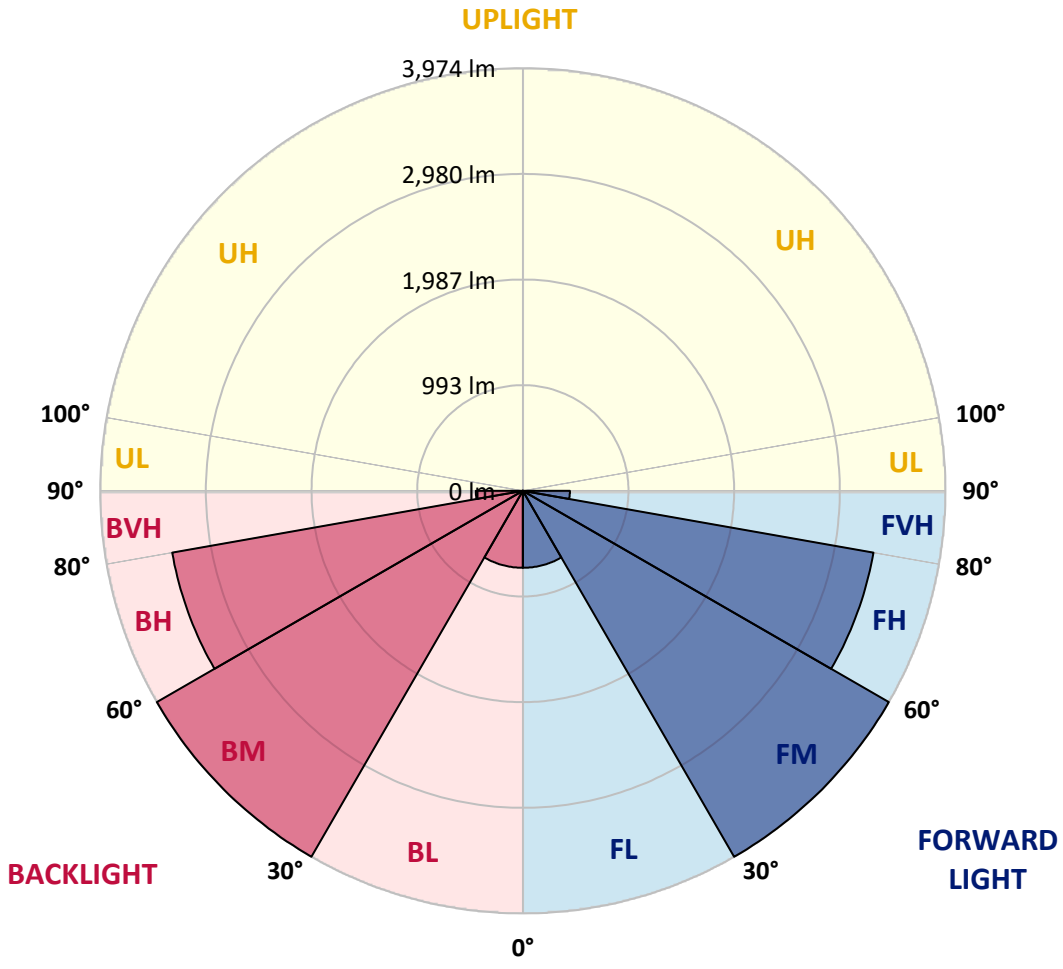
Scaled Data Report

REPORT NUMBER: P879652
CATALOG NUMBER: EMM2-HTN-VA9-727-U-WQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	723.8	4.3			
FM	(30°-60°)	3973.5	23.4			
FH	(60°-80°)	3347.8	19.7			G2/5000
FVH	(80°-90°)	442.4	2.6			G3/500
BL	(0°-30°)	723.8	4.3	B2/1000		
BM	(30°-60°)	3973.5	23.4	B3/5000		
BH	(60°-80°)	3347.8	19.7	B4/5000		G2/5000
BVH	(80°-90°)	442.4	2.6			G3/500
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B4-U0-G3
Type V Short



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

Scaled Data Report

REPORT NUMBER: P879652
CATALOG NUMBER: EMM2-HTN-VA9-727-U-WQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1449.3	1449.3	1449.3	1449.3	1449.3	1449.3	1449.3	1449.3	1449.3	1449.3	1449.3
2.5°	1444.0	1446.2	1445.1	1445.1	1444.0	1445.1	1447.2	1448.3	1447.2	1448.3	1447.2
5°	1434.5	1434.5	1433.4	1432.3	1432.3	1432.3	1432.3	1432.3	1433.4	1433.4	1434.5
7.5°	1422.8	1422.8	1422.8	1424.9	1423.8	1424.9	1424.9	1423.8	1422.8	1422.8	1423.8
10°	1424.9	1423.8	1422.8	1424.9	1423.8	1424.9	1424.9	1422.8	1423.8	1424.9	1425.9
12.5°	1443.0	1440.8	1444.0	1447.2	1449.3	1451.5	1450.4	1449.3	1446.2	1443.0	1443.0
15°	1482.3	1480.2	1483.4	1487.6	1488.7	1489.8	1492.9	1488.7	1487.6	1482.3	1481.2
17.5°	1538.7	1537.6	1544.0	1552.5	1556.7	1562.1	1556.7	1552.5	1540.8	1538.7	1541.9
20°	1619.5	1616.3	1629.0	1642.9	1647.1	1653.5	1649.3	1640.7	1629.0	1616.3	1616.3
22.5°	1722.6	1730.1	1736.4	1747.1	1764.1	1774.7	1760.9	1746.0	1729.0	1721.6	1716.2
25°	1856.6	1855.5	1861.9	1883.2	1893.8	1901.3	1899.1	1878.9	1864.0	1853.4	1852.4
27.5°	1985.3	1998.0	2010.8	2024.6	2051.2	2054.4	2051.2	2026.7	2003.3	1994.8	1991.7
30°	2156.5	2154.3	2166.0	2199.0	2225.6	2227.7	2219.2	2189.4	2162.8	2146.9	2149.0
32.5°	2323.4	2306.4	2337.2	2359.6	2381.9	2405.3	2383.0	2359.6	2337.2	2303.2	2313.8
35°	2475.5	2489.3	2506.3	2552.0	2597.8	2607.3	2592.4	2544.6	2501.0	2485.0	2467.0
37.5°	2661.6	2661.6	2690.3	2757.3	2798.7	2813.6	2792.4	2744.5	2683.9	2660.5	2652.0
40°	2848.7	2848.7	2892.3	2948.7	3010.3	3031.6	3008.2	2945.5	2895.5	2834.9	2844.5
42.5°	3030.5	3045.4	3102.8	3172.0	3258.1	3286.8	3253.8	3169.8	3097.5	3040.1	3031.6
45°	3231.5	3254.9	3317.6	3431.4	3504.8	3546.3	3500.5	3428.2	3300.6	3245.3	3215.6
47.5°	3450.6	3466.5	3556.9	3665.4	3784.5	3828.1	3773.8	3655.8	3547.3	3449.5	3445.2
50°	3640.9	3637.7	3753.6	3903.6	4038.6	4080.1	4036.5	3908.9	3732.4	3623.9	3634.5
52.5°	3783.4	3801.5	3923.8	4108.8	4252.3	4312.9	4241.7	4088.6	3904.6	3791.9	3757.9
55°	3875.9	3905.7	4048.2	4248.1	4411.8	4476.7	4406.5	4230.0	4029.0	3883.3	3863.1
57.5°	3909.9	3922.7	4077.9	4304.4	4471.4	4535.2	4462.9	4290.6	4053.5	3901.4	3888.7
60°	3857.8	3870.6	4038.6	4270.4	4461.8	4516.0	4458.6	4256.6	4015.2	3860.0	3838.7
62.5°	3730.2	3765.3	3951.4	4181.1	4400.1	4445.9	4386.3	4165.1	3941.8	3754.7	3723.8
65°	3577.1	3614.3	3772.8	4029.0	4227.9	4276.8	4230.0	4017.3	3773.8	3594.1	3564.3
67.5°	3363.4	3369.7	3555.8	3815.3	4025.8	4085.4	4004.6	3811.0	3546.3	3376.1	3352.7
70°	3096.5	3100.7	3298.5	3538.8	3732.4	3781.3	3728.1	3521.8	3284.7	3099.7	3083.7
72.5°	2754.1	2793.4	2957.2	3195.4	3376.1	3433.6	3364.4	3189.0	2969.9	2787.0	2750.9
75°	2390.4	2414.9	2557.4	2788.1	2943.3	3014.6	2958.2	2788.1	2557.4	2406.4	2374.5
77.5°	1965.1	1998.0	2137.3	2331.9	2460.6	2537.1	2475.5	2324.5	2137.3	1999.1	1998.0
80°	1552.5	1544.0	1670.5	1838.5	1966.1	2010.8	1972.5	1825.8	1657.8	1550.4	1535.5
82.5°	1077.2	1075.0	1212.2	1324.9	1432.3	1483.4	1424.9	1330.2	1200.5	1104.8	1074.0
85°	612.5	626.3	716.7	786.9	878.3	909.2	889.0	799.6	683.7	599.7	594.4
87.5°	212.7	231.8	248.8	299.9	359.4	386.0	357.3	343.5	305.2	264.8	266.9
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-12

Test Date: 10/23/2024

Luminaire Tested: MEM2-HTN-VA-130-727-U-RW

Data in this report applies to families of products including MEM2-HTN-VA-130-727-U-RW

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

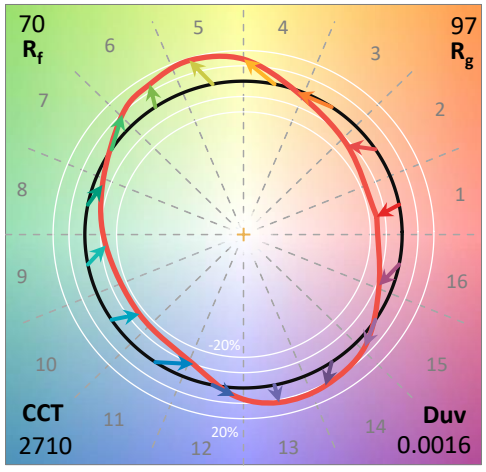
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-176-12
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	10/24/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	Streetworks
Catalog Number:	**MEM2-HTN-VA-130-727-U-RW**
Description:	EPIC MODERN VISUAL COMFORT 130W WAVESTREAM RECTANGULAR WIDE

Spectral Parameters

CCT (K):	2710	CRI (Ra):	70.4		
CIE u':	0.2616	R1:	67.3	R9:	-24.6
CIE v':	0.5295	R2:	79.1	R10:	51.3
Duv:	0.0016	R3:	89.5	R11:	61.0
CIE x:	0.4619	R4:	67.6	R12:	41.2
CIE y:	0.4154	R5:	64.7	R13:	68.7
CIE z:	0.1227	R6:	69.6	R14:	93.5
Peak Wavelength (nm):	601	R7:	78.9	R15:	60.6
Dominant Wavelength (nm):	583	R8:	46.2		
Purity:	63.3407				

Rf:	70.4
Rg:	96.7



Test Conditions

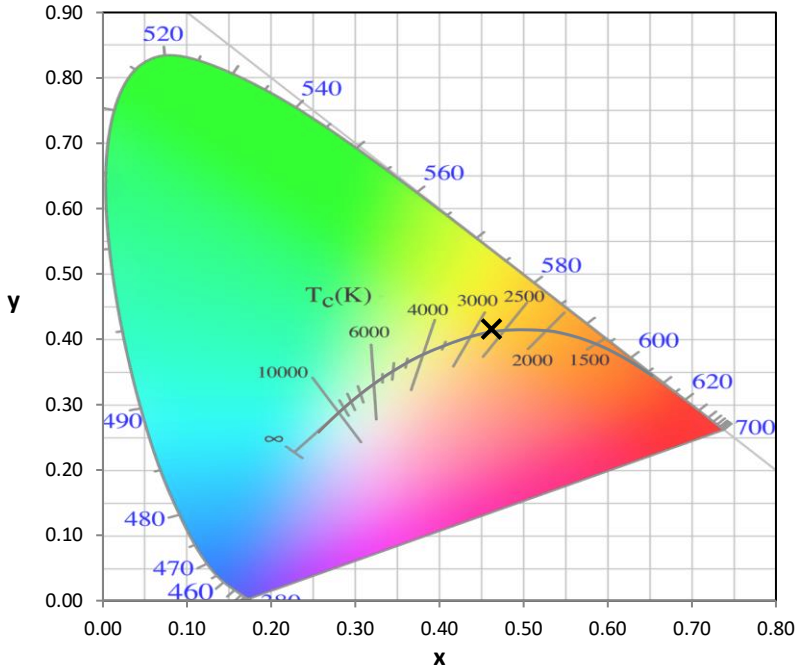
Stabilization Time:	47M
Operation Time:	1H 47M
Sphere Temperature (°C):	24.4

REPORT NUMBER: SP1-2407-176-12

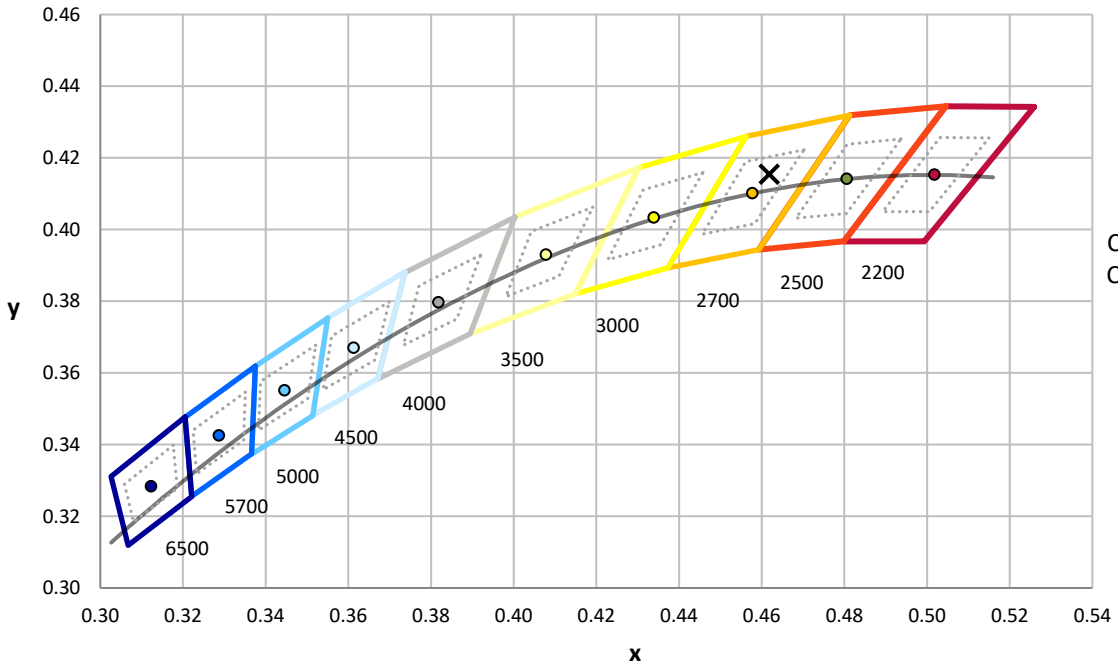
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085	10/22/2024	10/22/2025
Room Thermometer	IN0046	10/22/2024	10/22/2025

REPORT NUMBER: SP1-2407-176-12

CIE 1931 Chromaticity Diagram



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

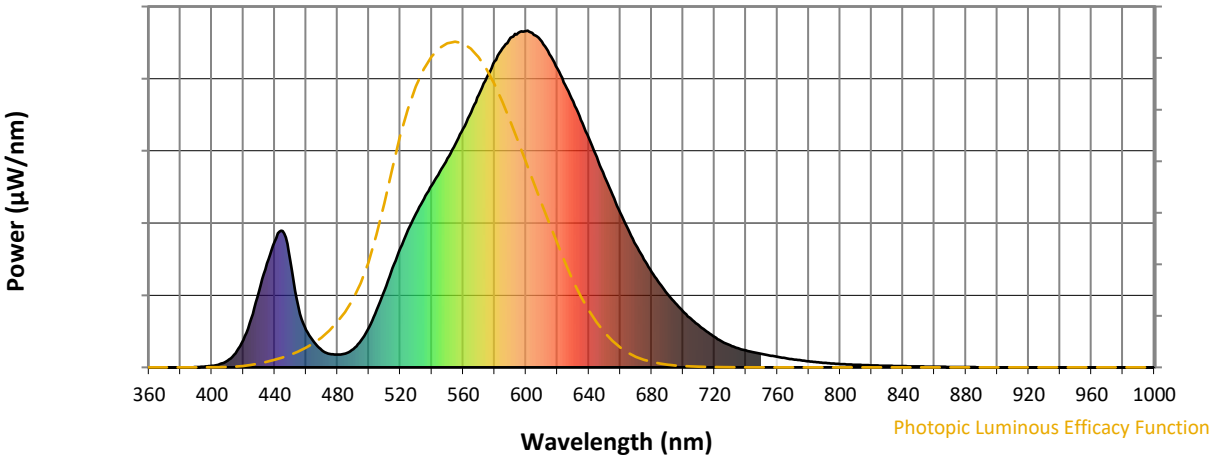


CCT = 2710K
CIE x = 0.4619
CIE y = 0.4154
Duv = 0.0016

Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2407-176-12

Photopic Flux vs. Wavelength

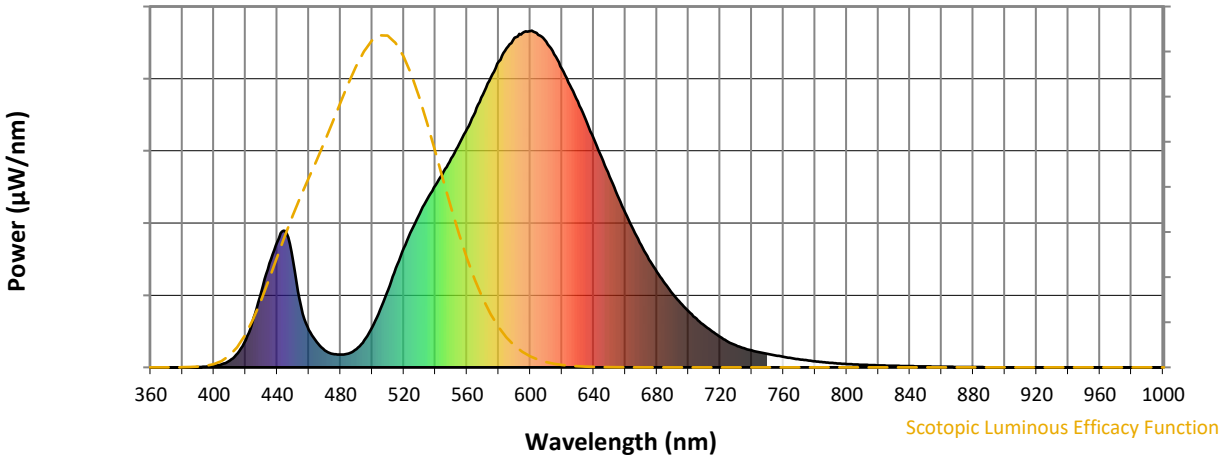


Photopic Lumens: NR

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	54	NR	620	887	NR	750	40	NR	880	1	NR
365	0	NR	495	80	NR	625	838	NR	755	35	NR	885	1	NR
370	0	NR	500	119	NR	630	790	NR	760	31	NR	890	0	NR
375	0	NR	505	171	NR	635	735	NR	765	27	NR	895	0	NR
380	0	NR	510	230	NR	640	681	NR	770	24	NR	900	0	NR
385	0	NR	515	295	NR	645	624	NR	775	21	NR	905	0	NR
390	1	NR	520	354	NR	650	567	NR	780	18	NR	910	0	NR
395	2	NR	525	408	NR	655	512	NR	785	15	NR	915	0	NR
400	5	NR	530	457	NR	660	459	NR	790	13	NR	920	0	NR
405	9	NR	535	500	NR	665	410	NR	795	12	NR	925	0	NR
410	20	NR	540	541	NR	670	363	NR	800	10	NR	930	0	NR
415	42	NR	545	581	NR	675	320	NR	805	9	NR	935	0	NR
420	81	NR	550	620	NR	680	283	NR	810	8	NR	940	0	NR
425	145	NR	555	664	NR	685	249	NR	815	7	NR	945	0	NR
430	225	NR	560	709	NR	690	219	NR	820	6	NR	950	0	NR
435	309	NR	565	758	NR	695	191	NR	825	5	NR	955	0	NR
440	373	NR	570	810	NR	700	166	NR	830	5	NR	960	0	NR
445	405	NR	575	861	NR	705	144	NR	835	4	NR	965	0	NR
450	316	NR	580	908	NR	710	124	NR	840	4	NR	970	0	NR
455	180	NR	585	948	NR	715	106	NR	845	3	NR	975	0	NR
460	111	NR	590	978	NR	720	90	NR	850	3	NR	980	0	NR
465	75	NR	595	993	NR	725	76	NR	855	2	NR	985	0	NR
470	50	NR	600	999	NR	730	65	NR	860	2	NR	990	0	NR
475	40	NR	605	988	NR	735	57	NR	865	2	NR	995	0	NR
480	38	NR	610	967	NR	740	50	NR	870	1	NR	1000	0	NR
485	41	NR	615	930	NR	745	45	NR	875	1	NR			

REPORT NUMBER: SP1-2407-176-12

Scotopic Flux vs. Wavelength

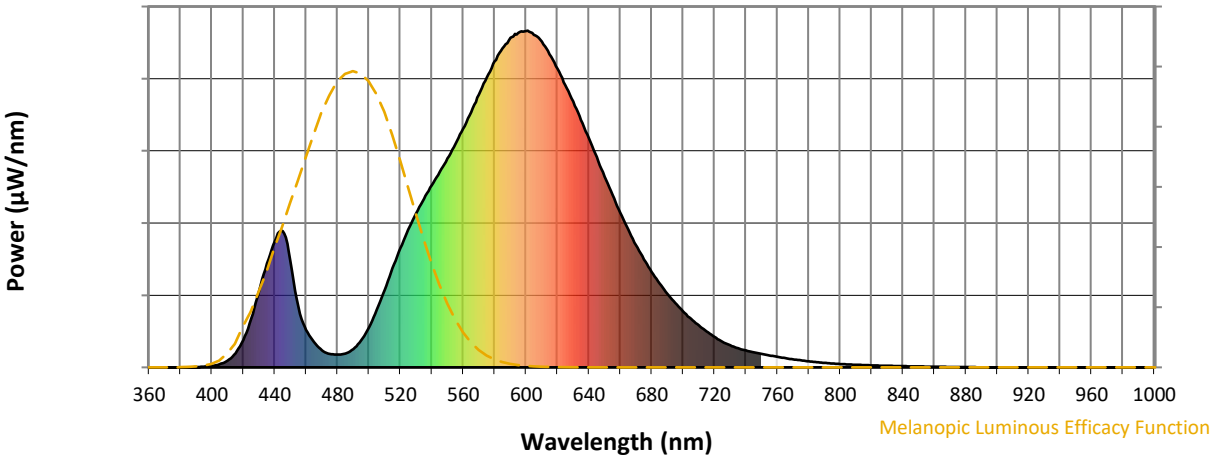


Scotopic Lumens: NR **S/P: 1.02**

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	54	NR	620	887	NR	750	40	NR	880	1	NR
365	0	NR	495	80	NR	625	838	NR	755	35	NR	885	1	NR
370	0	NR	500	119	NR	630	790	NR	760	31	NR	890	0	NR
375	0	NR	505	171	NR	635	735	NR	765	27	NR	895	0	NR
380	0	NR	510	230	NR	640	681	NR	770	24	NR	900	0	NR
385	0	NR	515	295	NR	645	624	NR	775	21	NR	905	0	NR
390	1	NR	520	354	NR	650	567	NR	780	18	NR	910	0	NR
395	2	NR	525	408	NR	655	512	NR	785	15	NR	915	0	NR
400	5	NR	530	457	NR	660	459	NR	790	13	NR	920	0	NR
405	9	NR	535	500	NR	665	410	NR	795	12	NR	925	0	NR
410	20	NR	540	541	NR	670	363	NR	800	10	NR	930	0	NR
415	42	NR	545	581	NR	675	320	NR	805	9	NR	935	0	NR
420	81	NR	550	620	NR	680	283	NR	810	8	NR	940	0	NR
425	145	NR	555	664	NR	685	249	NR	815	7	NR	945	0	NR
430	225	NR	560	709	NR	690	219	NR	820	6	NR	950	0	NR
435	309	NR	565	758	NR	695	191	NR	825	5	NR	955	0	NR
440	373	NR	570	810	NR	700	166	NR	830	5	NR	960	0	NR
445	405	NR	575	861	NR	705	144	NR	835	4	NR	965	0	NR
450	316	NR	580	908	NR	710	124	NR	840	4	NR	970	0	NR
455	180	NR	585	948	NR	715	106	NR	845	3	NR	975	0	NR
460	111	NR	590	978	NR	720	90	NR	850	3	NR	980	0	NR
465	75	NR	595	993	NR	725	76	NR	855	2	NR	985	0	NR
470	50	NR	600	999	NR	730	65	NR	860	2	NR	990	0	NR
475	40	NR	605	988	NR	735	57	NR	865	2	NR	995	0	NR
480	38	NR	610	967	NR	740	50	NR	870	1	NR	1000	0	NR
485	41	NR	615	930	NR	745	45	NR	875	1	NR			

REPORT NUMBER: SP1-2407-176-12

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 1.71**

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	54	NR	620	887	NR	750	40	NR	880	1	NR
365	0	NR	495	80	NR	625	838	NR	755	35	NR	885	1	NR
370	0	NR	500	119	NR	630	790	NR	760	31	NR	890	0	NR
375	0	NR	505	171	NR	635	735	NR	765	27	NR	895	0	NR
380	0	NR	510	230	NR	640	681	NR	770	24	NR	900	0	NR
385	0	NR	515	295	NR	645	624	NR	775	21	NR	905	0	NR
390	1	NR	520	354	NR	650	567	NR	780	18	NR	910	0	NR
395	2	NR	525	408	NR	655	512	NR	785	15	NR	915	0	NR
400	5	NR	530	457	NR	660	459	NR	790	13	NR	920	0	NR
405	9	NR	535	500	NR	665	410	NR	795	12	NR	925	0	NR
410	20	NR	540	541	NR	670	363	NR	800	10	NR	930	0	NR
415	42	NR	545	581	NR	675	320	NR	805	9	NR	935	0	NR
420	81	NR	550	620	NR	680	283	NR	810	8	NR	940	0	NR
425	145	NR	555	664	NR	685	249	NR	815	7	NR	945	0	NR
430	225	NR	560	709	NR	690	219	NR	820	6	NR	950	0	NR
435	309	NR	565	758	NR	695	191	NR	825	5	NR	955	0	NR
440	373	NR	570	810	NR	700	166	NR	830	5	NR	960	0	NR
445	405	NR	575	861	NR	705	144	NR	835	4	NR	965	0	NR
450	316	NR	580	908	NR	710	124	NR	840	4	NR	970	0	NR
455	180	NR	585	948	NR	715	106	NR	845	3	NR	975	0	NR
460	111	NR	590	978	NR	720	90	NR	850	3	NR	980	0	NR
465	75	NR	595	993	NR	725	76	NR	855	2	NR	985	0	NR
470	50	NR	600	999	NR	730	65	NR	860	2	NR	990	0	NR
475	40	NR	605	988	NR	735	57	NR	865	2	NR	995	0	NR
480	38	NR	610	967	NR	740	50	NR	870	1	NR	1000	0	NR
485	41	NR	615	930	NR	745	45	NR	875	1	NR			

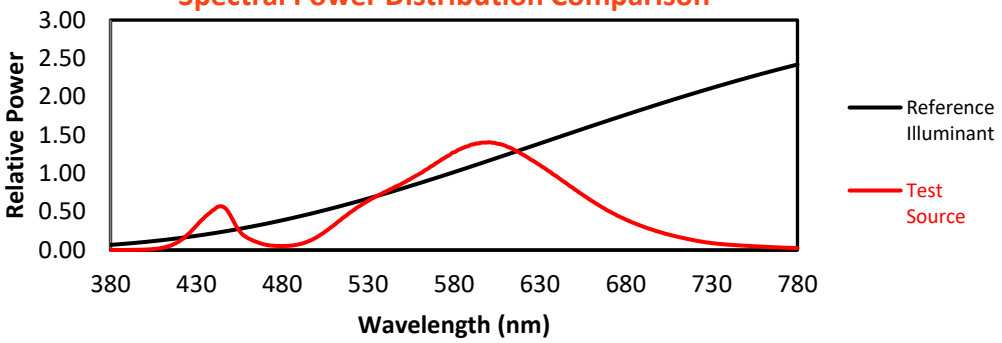
REPORT NUMBER: SP1-2407-176-12

TM-30-18

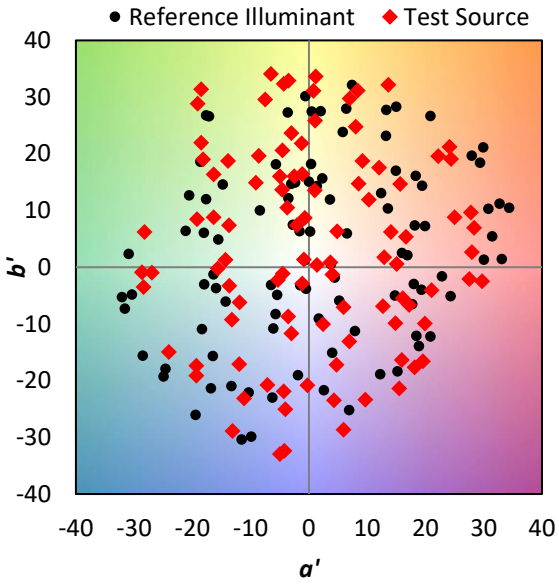
Summary

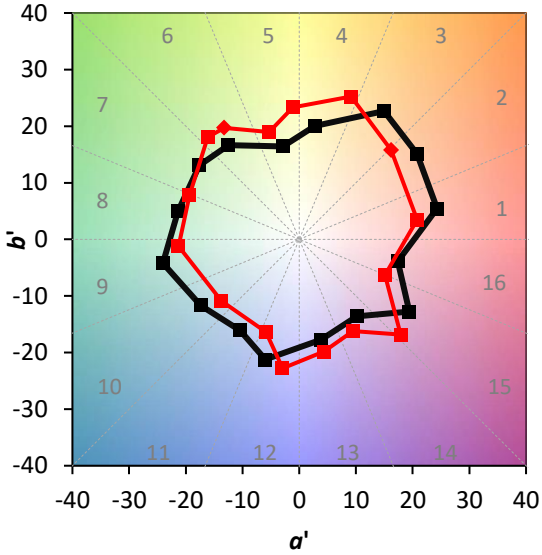
R_f = 70.4
R_g = 96.7
CIE R_a = 70.4
R_9 = -24.6

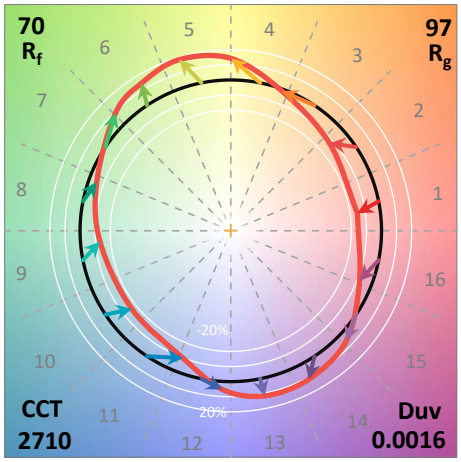
Spectral Power Distribution Comparison

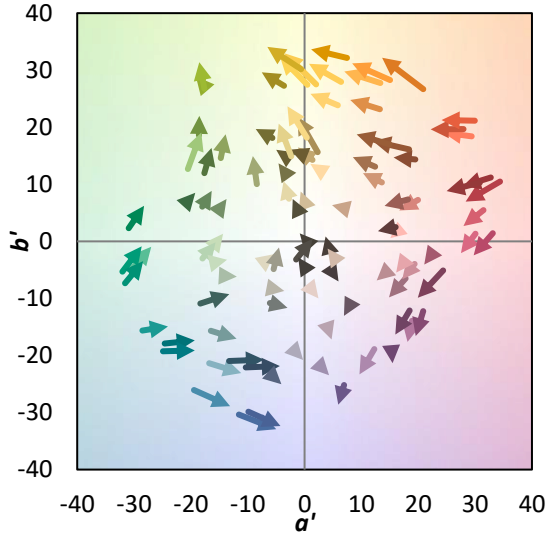


Color Vector Graphics







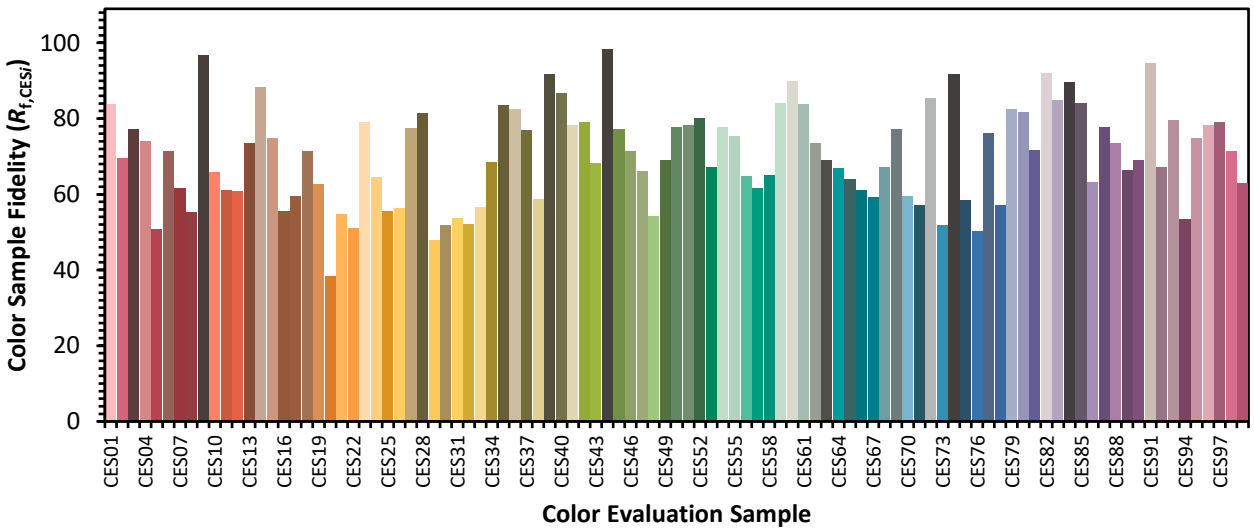


REPORT NUMBER: SP1-2407-176-12

TM-30-18

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

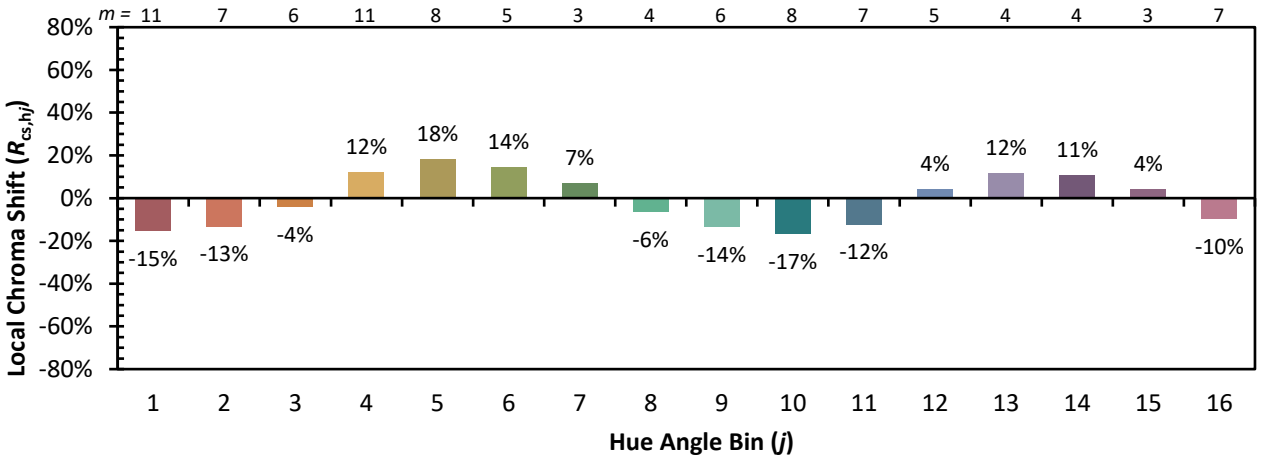
CES01 = 86	CES26 = 56	CES51 = 78	CES76 = 50
CES02 = 63	CES27 = 77	CES52 = 80	CES77 = 76
CES03 = 31	CES28 = 81	CES53 = 67	CES78 = 57
CES04 = 71	CES29 = 48	CES54 = 78	CES79 = 82
CES05 = 50	CES30 = 52	CES55 = 75	CES80 = 82
CES06 = 52	CES31 = 54	CES56 = 65	CES81 = 72
CES07 = 42	CES32 = 52	CES57 = 62	CES82 = 92
CES08 = 41	CES33 = 57	CES58 = 65	CES83 = 85
CES09 = 29	CES34 = 69	CES59 = 84	CES84 = 90
CES10 = 77	CES35 = 84	CES60 = 90	CES85 = 84
CES11 = 60	CES36 = 82	CES61 = 84	CES86 = 63
CES12 = 66	CES37 = 77	CES62 = 73	CES87 = 78
CES13 = 43	CES38 = 59	CES63 = 69	CES88 = 74
CES14 = 74	CES39 = 92	CES64 = 67	CES89 = 66
CES15 = 71	CES40 = 87	CES65 = 64	CES90 = 69
CES16 = 48	CES41 = 78	CES66 = 61	CES91 = 95
CES17 = 51	CES42 = 79	CES67 = 59	CES92 = 67
CES18 = 57	CES43 = 68	CES68 = 67	CES93 = 80
CES19 = 73	CES44 = 98	CES69 = 77	CES94 = 54
CES20 = 67	CES45 = 77	CES70 = 60	CES95 = 75
CES21 = 88	CES46 = 71	CES71 = 57	CES96 = 78
CES22 = 80	CES47 = 66	CES72 = 85	CES97 = 79
CES23 = 92	CES48 = 54	CES73 = 52	CES98 = 71
CES24 = 92	CES49 = 69	CES74 = 92	CES99 = 63
CES25 = 73	CES50 = 78	CES75 = 58	

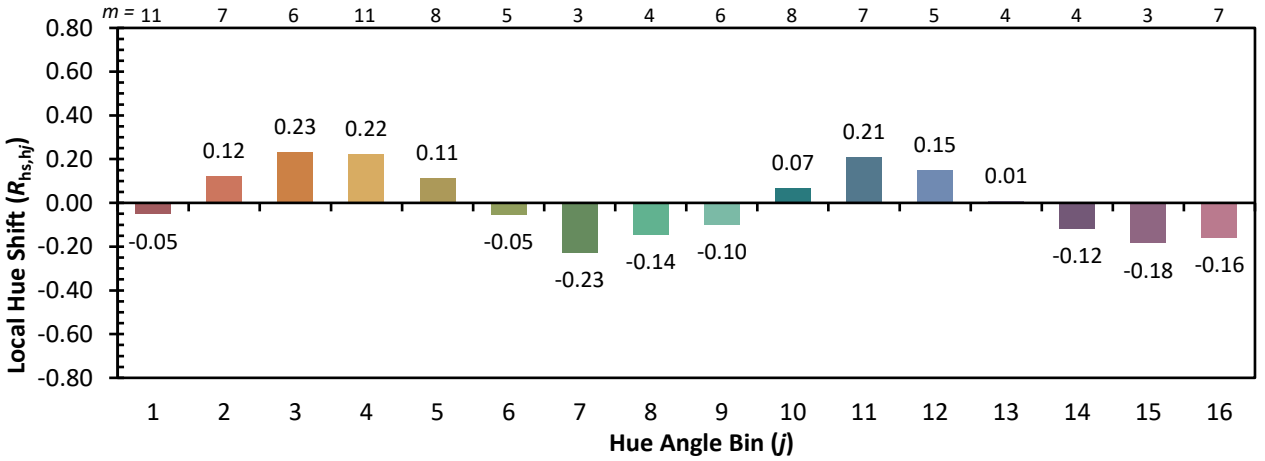


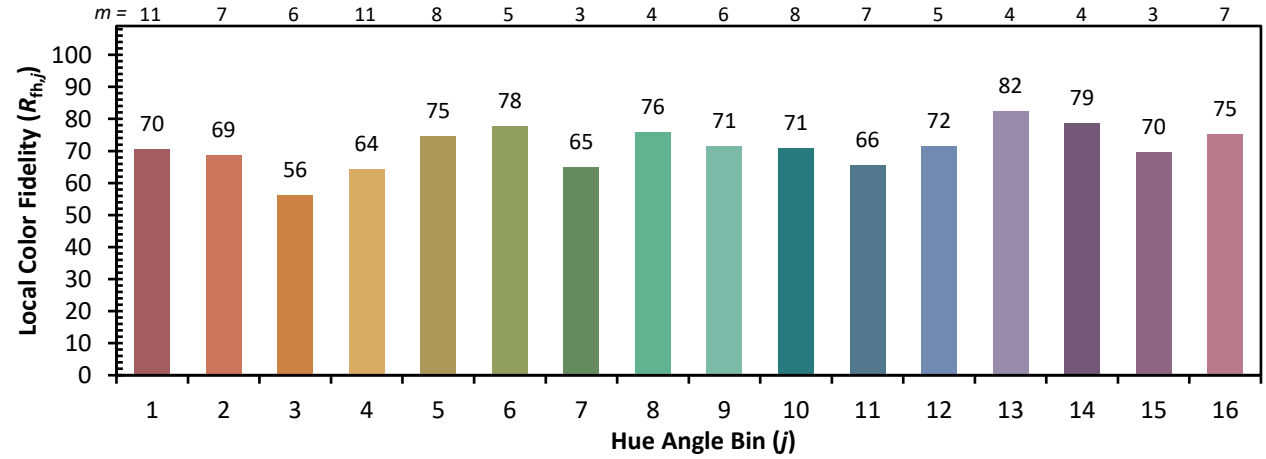
REPORT NUMBER: SP1-2407-176-12

TM-30-18

Color Rendition by Hue-Angle Bin



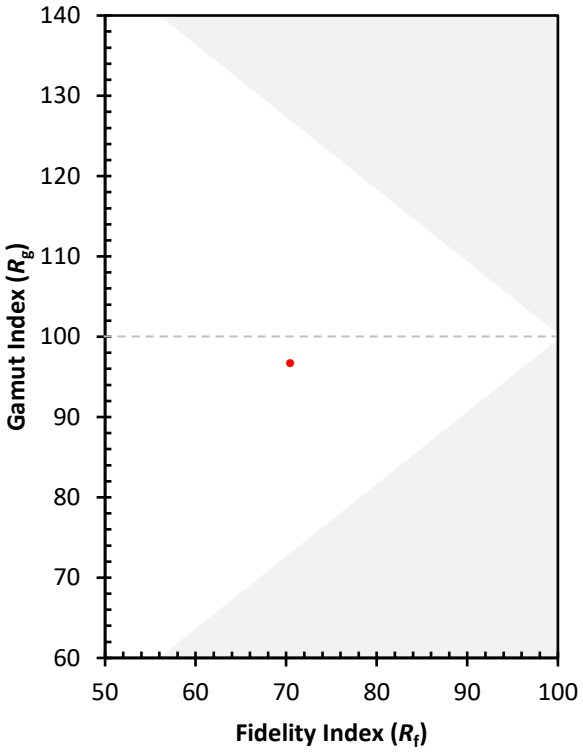


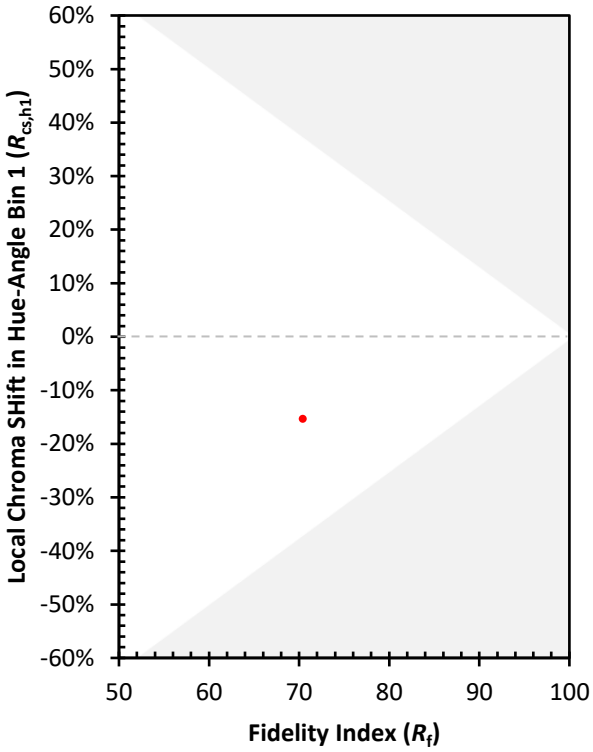


REPORT NUMBER: SP1-2407-176-12

TM-30-18

Measure Comparisons





(END OF REPORT)