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: P880403

Luminaire Tested: **EMM2-HSN-VA4-730-U-MQ**

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:	P880403
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	10/01/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	INVUE
Catalog Number:	EMM2-HSN-VA4-730-U-MQ
Description:	EPIC MODERN SHORT HOUSING 4W 70CRI 3000K VISUAL COMFORT FIXTURE w/ TYPE V MEDIUM DISTRIBUTION OPTIC
Light Source:	(1) 3000K CCT, 70 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	6768.3 lumens
Efficiency:	N/A
Efficacy:	114.7 lumens/watt
Luminous Opening:	Circular (Dia: 1.12' x H: 0')
IES Classification:	Type V - Short
BUG Rating:	B3 - U0 - G2

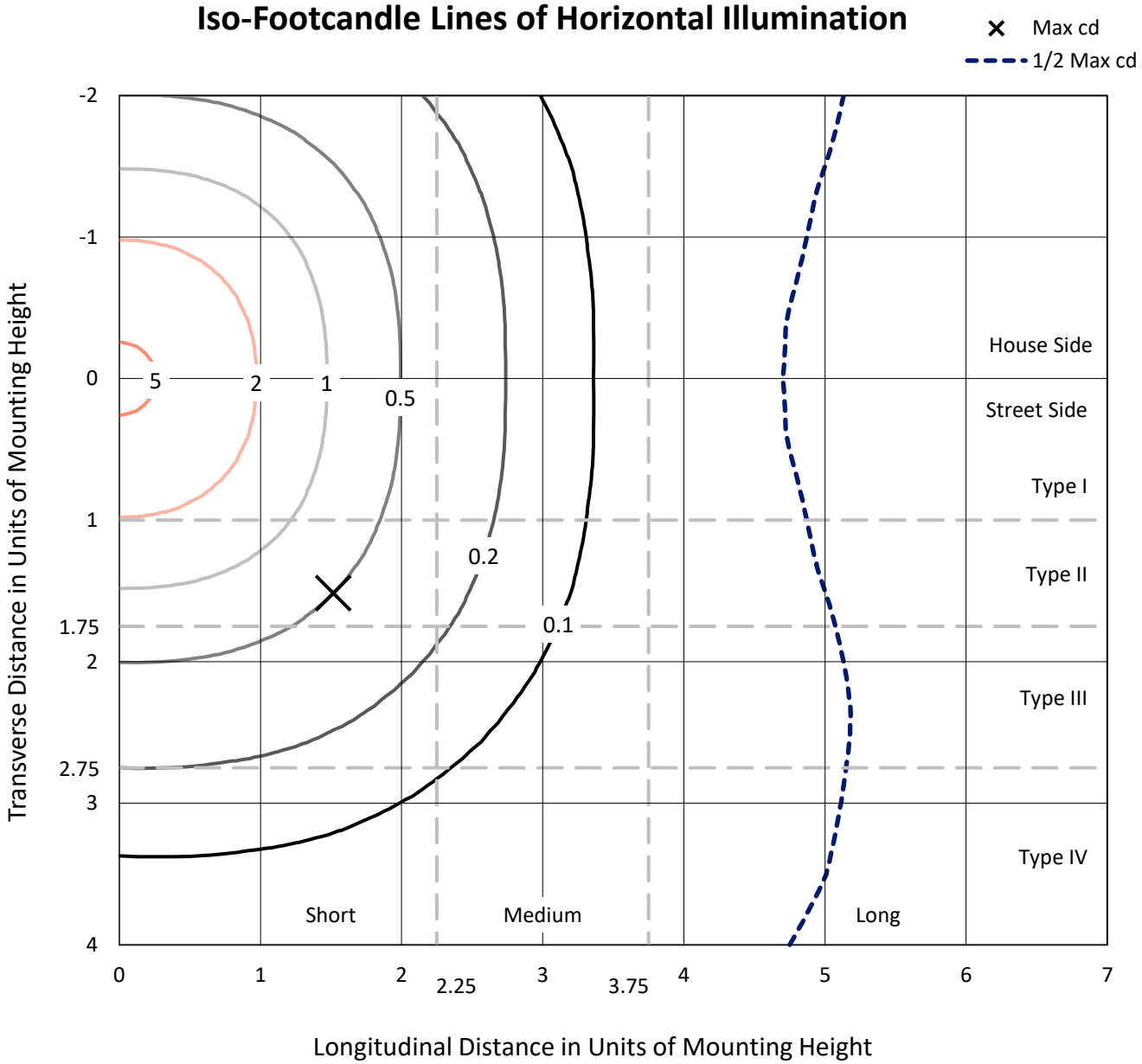
Input Watts (W):	59
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	0.99
Total Harmonic Distortion (THDi):	9%
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	24 FT

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

Scaled Data Report

REPORT NUMBER: P880403
CATALOG NUMBER: EMM2-HSN-VA4-730-U-MQ

Iso-Footcandle Lines of Horizontal Illumination



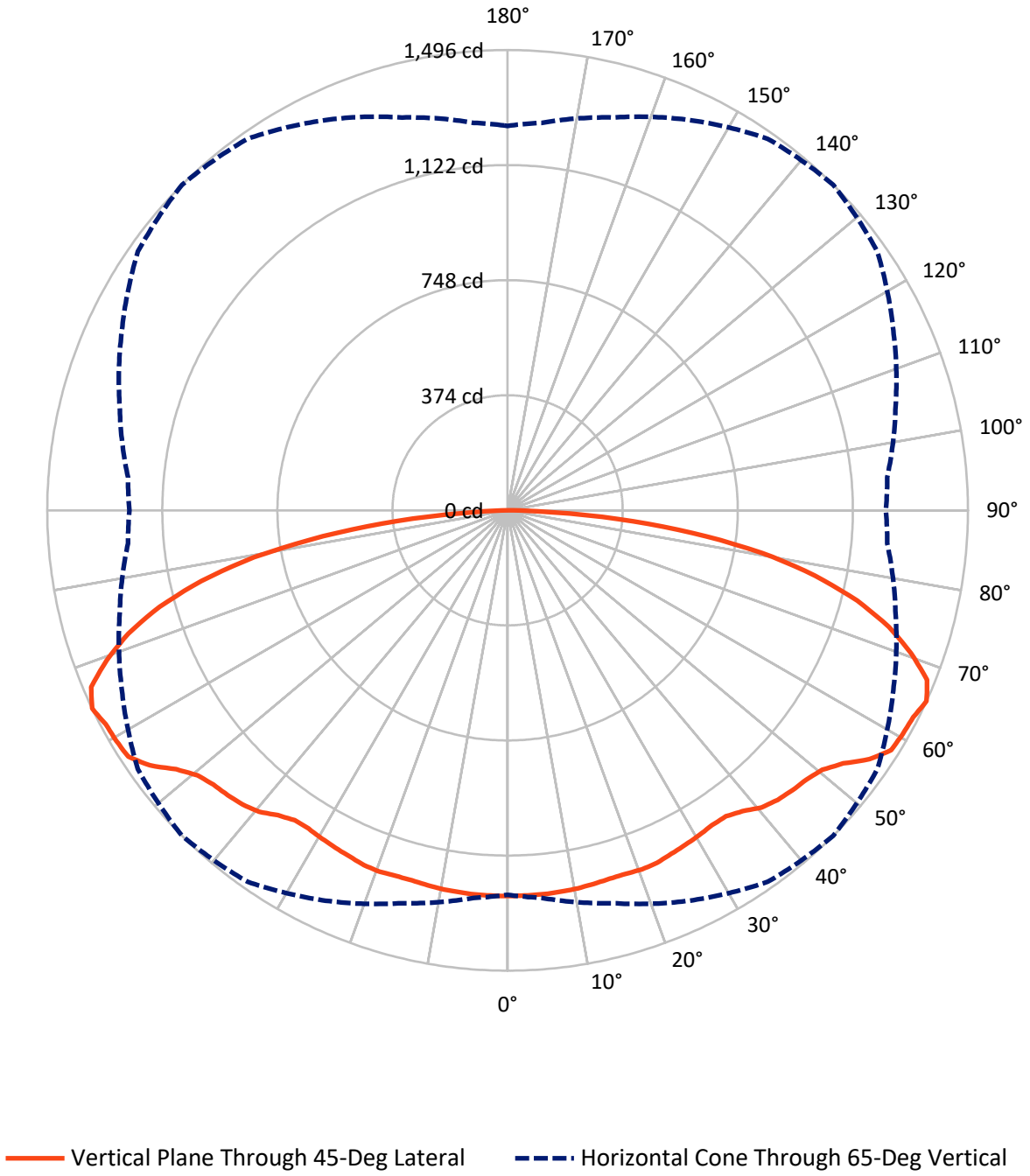
Based on 15 foot mounting height. Maximum calculated value = 5.6 fc
Type V - Short - N/A

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

Scaled Data Report

REPORT NUMBER: P880403
CATALOG NUMBER: EMM2-HSN-VA4-730-U-MQ

Luminous Intensity Polar Plot



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

Scaled Data Report

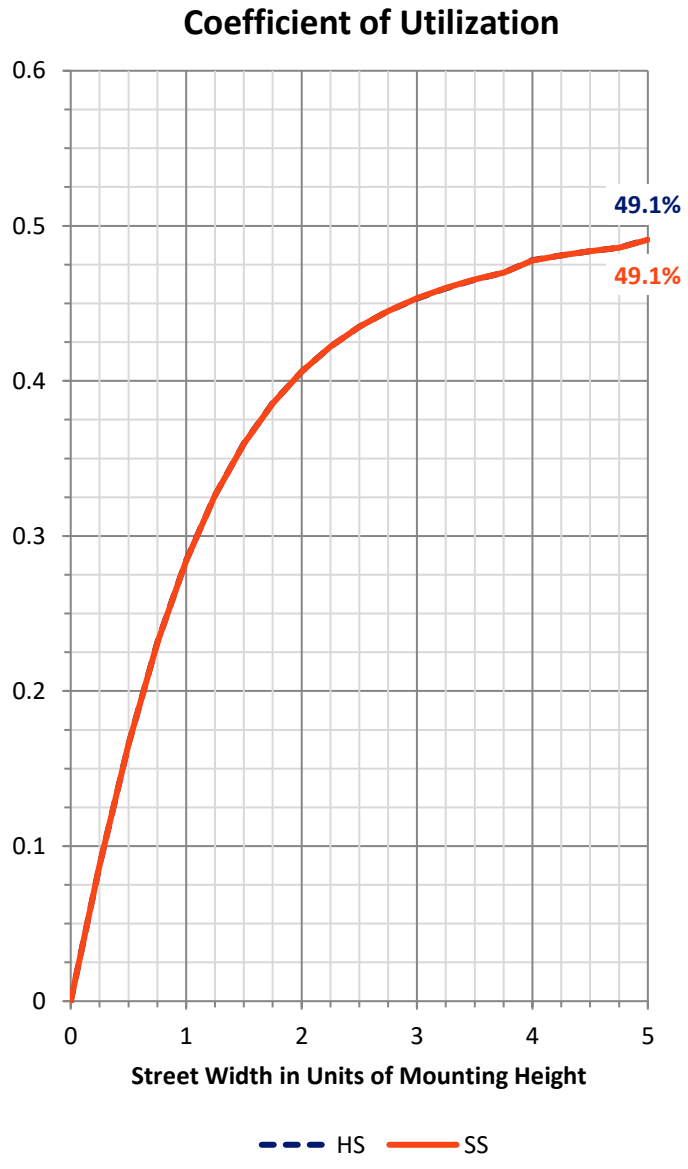
REPORT NUMBER: P880403
CATALOG NUMBER: EMM2-HSN-VA4-730-U-MQ

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	3384.2	0.0	3384.2
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	3384.2	0.0	3384.2
	% Fixture	50.0	0.0	50.0
Total	Lumens	6768.3	0.0	6768.3
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	119.5	1.8
10°-20°	352.4	5.2
20°-30°	570.5	8.4
30°-40°	766.7	11.3
40°-50°	978.5	14.5
50°-60°	1203.8	17.8
60°-70°	1340.5	19.8
70°-80°	1088.1	16.1
80°-90°	348.3	5.1
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°	6768.3	100.0
0°-180°	6768.3	100.0



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

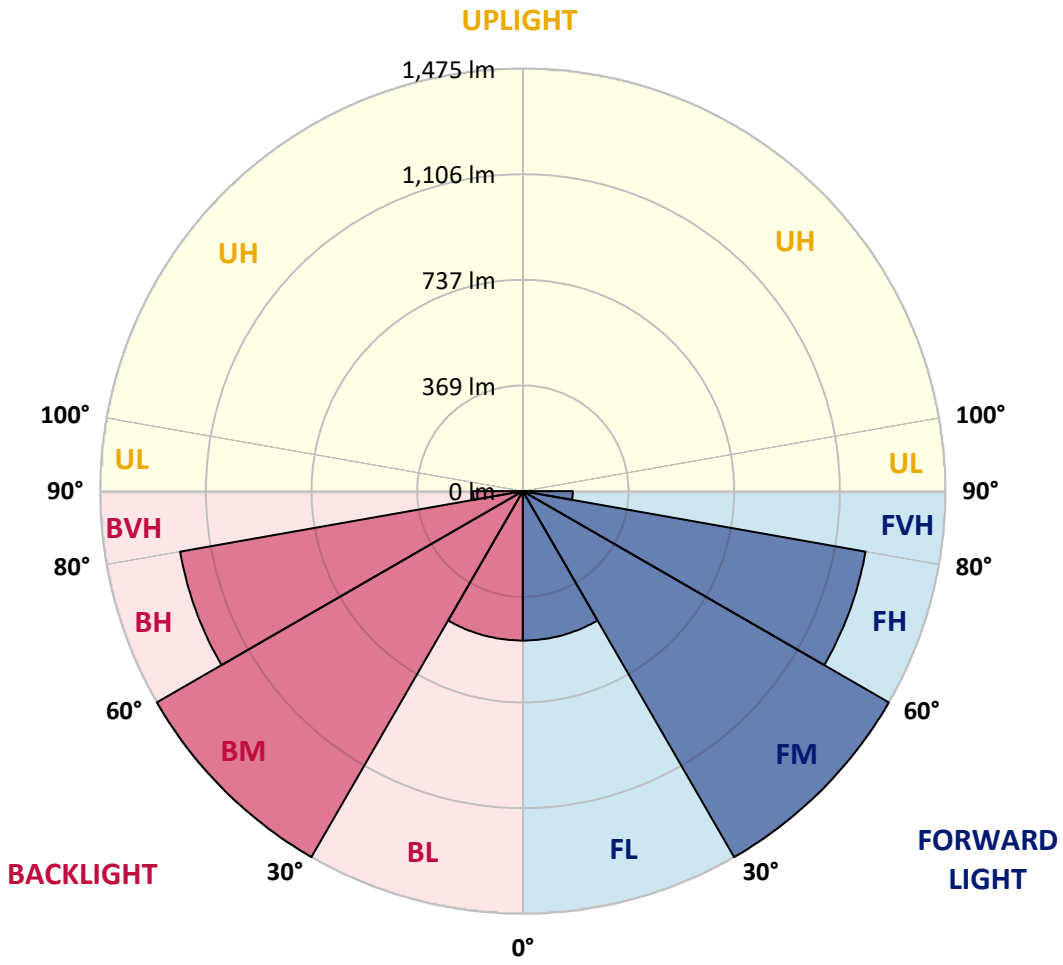
Scaled Data Report

REPORT NUMBER: P880403
CATALOG NUMBER: EMM2-HSN-VA4-730-U-MQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	521.2	7.7			
FM	(30°-60°)	1474.5	21.8			
FH	(60°-80°)	1214.3	17.9			G1/1800
FVH	(80°-90°)	174.2	2.6			G2/225
BL	(0°-30°)	521.2	7.7	B2/1000		
BM	(30°-60°)	1474.5	21.8	B2/2500		
BH	(60°-80°)	1214.3	17.9	B3/2500		G1/1800
BVH	(80°-90°)	174.2	2.6			G2/225
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



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

Scaled Data Report

REPORT NUMBER: P880403
CATALOG NUMBER: EMM2-HSN-VA4-730-U-MQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5
2.5°	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5
5°	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1251.6	1253.5	1253.5
7.5°	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6
10°	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8
12.5°	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1
15°	1240.5	1242.3	1242.3	1242.3	1242.3	1242.3	1242.3	1242.3	1242.3	1240.5	1240.5
17.5°	1238.6	1238.6	1238.6	1240.5	1242.3	1242.3	1242.3	1240.5	1238.6	1236.8	1236.8
20°	1240.5	1240.5	1240.5	1242.3	1244.2	1246.1	1244.2	1242.3	1238.6	1238.6	1238.6
22.5°	1238.6	1240.5	1240.5	1242.3	1244.2	1244.2	1242.3	1240.5	1238.6	1236.8	1236.8
25°	1233.1	1233.1	1234.9	1236.8	1236.8	1236.8	1236.8	1233.1	1231.2	1229.4	1229.4
27.5°	1225.7	1227.5	1227.5	1229.4	1231.2	1231.2	1229.4	1225.7	1223.8	1221.9	1221.9
30°	1216.4	1216.4	1218.2	1221.9	1223.8	1225.7	1221.9	1218.2	1212.7	1210.8	1210.8
32.5°	1207.1	1209.0	1212.7	1216.4	1218.2	1220.1	1216.4	1212.7	1207.1	1203.4	1201.6
35°	1203.4	1203.4	1209.0	1216.4	1221.9	1221.9	1218.2	1210.8	1203.4	1196.0	1196.0
37.5°	1209.0	1210.8	1218.2	1231.2	1240.5	1240.5	1238.6	1225.7	1212.7	1201.6	1199.7
40°	1221.9	1223.8	1236.8	1253.5	1268.3	1270.2	1262.7	1246.1	1227.5	1214.5	1210.8
42.5°	1229.4	1233.1	1247.9	1268.3	1281.3	1286.8	1277.6	1260.9	1236.8	1220.1	1218.2
45°	1233.1	1236.8	1253.5	1275.7	1292.4	1298.0	1288.7	1266.5	1240.5	1221.9	1220.1
47.5°	1234.9	1238.6	1255.3	1283.1	1301.7	1307.2	1299.8	1273.9	1242.3	1223.8	1221.9
50°	1236.8	1244.2	1264.6	1294.3	1322.1	1325.8	1314.7	1283.1	1249.8	1227.5	1221.9
52.5°	1249.8	1255.3	1285.0	1327.6	1355.5	1366.6	1349.9	1318.4	1268.3	1234.9	1231.2
55°	1281.3	1283.1	1318.4	1372.1	1412.9	1427.8	1401.8	1359.2	1298.0	1264.6	1262.7
57.5°	1290.6	1301.7	1340.6	1401.8	1451.9	1470.4	1448.2	1383.3	1327.6	1283.1	1272.0
60°	1281.3	1290.6	1336.9	1407.4	1461.1	1476.0	1459.3	1398.1	1316.5	1266.5	1257.2
62.5°	1272.0	1283.1	1331.3	1411.1	1463.0	1479.7	1451.9	1400.0	1311.0	1260.9	1251.6
65°	1249.8	1264.6	1322.1	1400.0	1474.1	1496.4	1466.7	1383.3	1305.4	1238.6	1229.4
67.5°	1207.1	1214.5	1277.6	1368.4	1448.2	1470.4	1438.9	1351.7	1259.0	1194.1	1186.7
70°	1127.4	1144.1	1203.4	1303.5	1379.6	1390.7	1366.6	1279.4	1188.6	1120.0	1110.7
72.5°	1021.7	1045.8	1110.7	1212.7	1273.9	1296.1	1264.6	1194.1	1099.6	1021.7	1008.7
75°	910.4	923.4	990.2	1090.3	1153.3	1173.7	1145.9	1077.3	964.2	910.4	897.5
77.5°	788.1	797.3	856.7	945.7	1005.0	1021.7	993.9	938.2	836.3	786.2	780.6
80°	617.5	636.0	691.6	767.7	812.2	838.1	808.5	754.7	680.5	621.2	611.9
82.5°	441.3	454.3	504.4	556.3	598.9	606.3	593.4	541.4	485.8	439.5	428.3
85°	241.1	246.6	278.1	331.9	348.6	361.6	343.0	304.1	276.3	246.6	237.3
87.5°	63.0	64.9	74.2	87.1	94.6	96.4	94.6	83.4	68.6	53.8	59.3
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: SP1-2407-176-3

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-730-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-730-U-WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

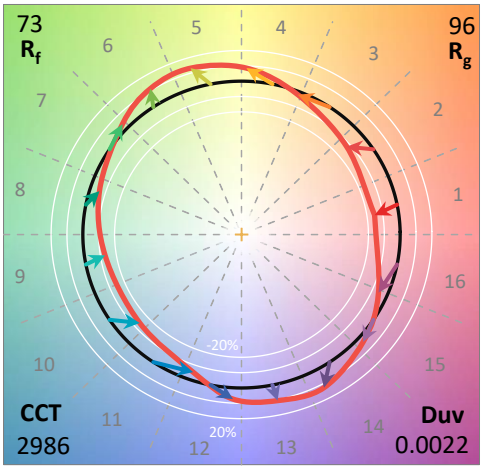
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2407-176-3
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	09/27/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	Streetworks
Catalog Number:	**MEM2-HTN-VA-30-730-U-WQ**
Description:	EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE

Spectral Parameters

CCT (K):	2986	CRI (Ra):	71.3		
CIE u':	0.2503	R1:	68.5	R9:	-25.2
CIE v':	0.5248	R2:	79.2	R10:	51.0
Duv:	0.0022	R3:	88.4	R11:	63.6
CIE x:	0.4413	R4:	69.4	R12:	39.8
CIE y:	0.4112	R5:	66.3	R13:	69.9
CIE z:	0.1476	R6:	70.0	R14:	92.9
Peak Wavelength (nm):	596	R7:	80.1	R15:	61.4
Dominant Wavelength (nm):	582	R8:	48.3		
Purity:	55.87534				

Rf:	73.2
Rg:	95.9



Test Conditions

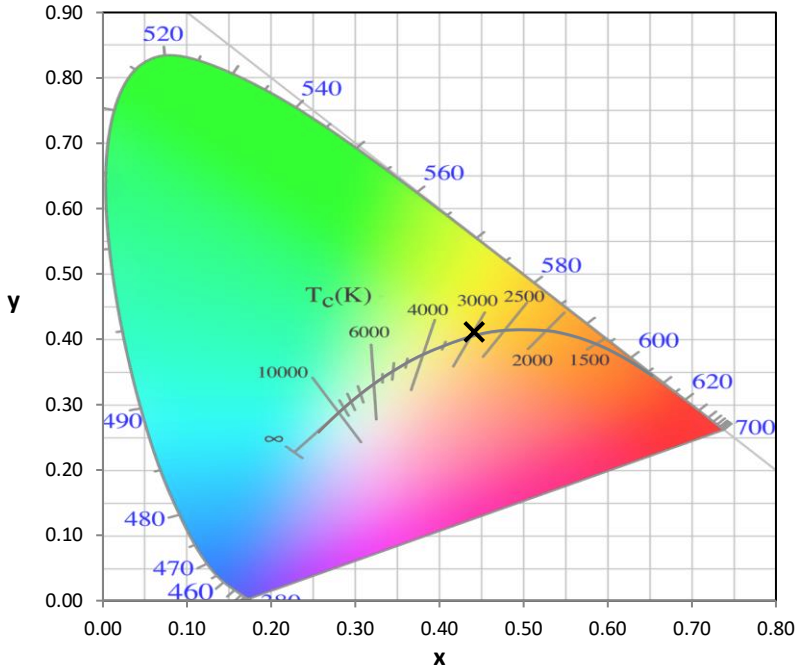
Stabilization Time:	27M
Operation Time:	1H 27M
Sphere Temperature (°C):	25.2

REPORT NUMBER: SP1-2407-176-3

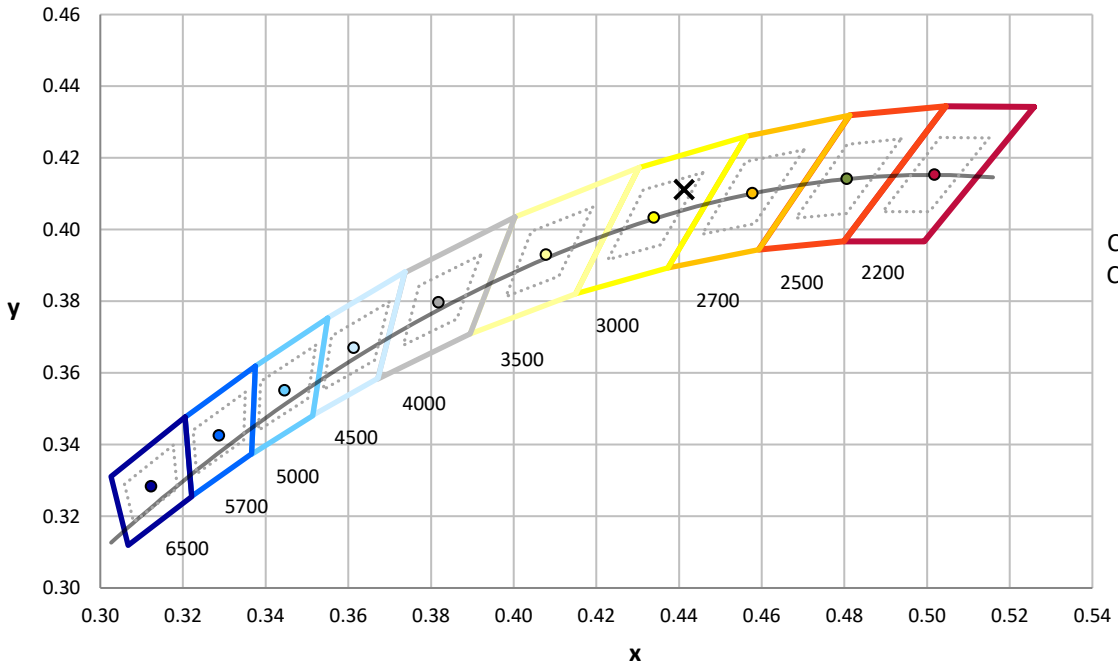
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085	10/24/2023	10/24/2024
Room Thermometer	IN0046	10/24/2023	10/24/2024

REPORT NUMBER: SP1-2407-176-3

CIE 1931 Chromaticity Diagram



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

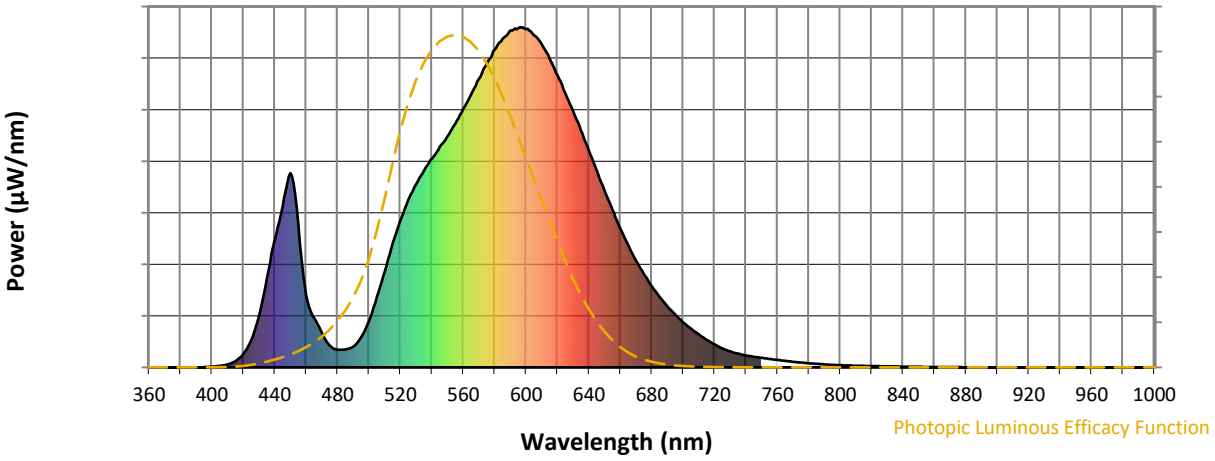


CCT = 2986K
CIE x = 0.4413
CIE y = 0.4112
Duv = 0.0022

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-176-3

Photopic Flux vs. Wavelength

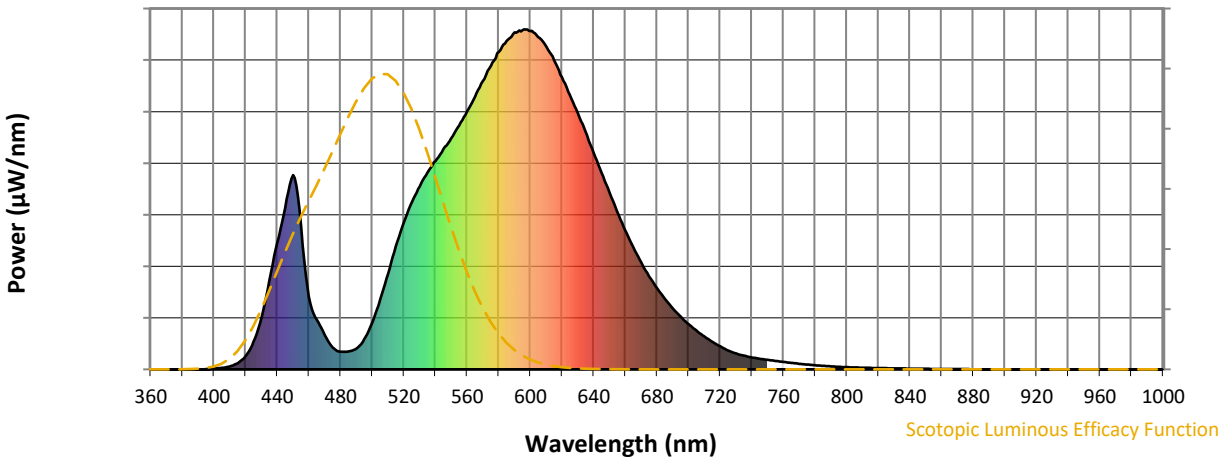


Photopic Lumens: NR

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	61	NR	620	859	NR	750	28	NR	880	0	NR
365	0	NR	495	88	NR	625	807	NR	755	25	NR	885	0	NR
370	0	NR	500	137	NR	630	753	NR	760	22	NR	890	0	NR
375	0	NR	505	205	NR	635	697	NR	765	19	NR	895	0	NR
380	0	NR	510	281	NR	640	637	NR	770	16	NR	900	0	NR
385	0	NR	515	363	NR	645	578	NR	775	14	NR	905	0	NR
390	0	NR	520	432	NR	650	520	NR	780	12	NR	910	0	NR
395	1	NR	525	492	NR	655	463	NR	785	10	NR	915	0	NR
400	2	NR	530	539	NR	660	409	NR	790	9	NR	920	0	NR
405	4	NR	535	579	NR	665	359	NR	795	8	NR	925	0	NR
410	9	NR	540	613	NR	670	315	NR	800	6	NR	930	0	NR
415	18	NR	545	648	NR	675	274	NR	805	6	NR	935	0	NR
420	39	NR	550	680	NR	680	239	NR	810	5	NR	940	0	NR
425	81	NR	555	717	NR	685	207	NR	815	4	NR	945	0	NR
430	151	NR	560	759	NR	690	180	NR	820	4	NR	950	0	NR
435	263	NR	565	803	NR	695	155	NR	825	3	NR	955	0	NR
440	375	NR	570	848	NR	700	133	NR	830	3	NR	960	0	NR
445	474	NR	575	892	NR	705	114	NR	835	3	NR	965	0	NR
450	571	NR	580	933	NR	710	97	NR	840	2	NR	970	0	NR
455	421	NR	585	966	NR	715	81	NR	845	2	NR	975	0	NR
460	214	NR	590	991	NR	720	67	NR	850	2	NR	980	0	NR
465	146	NR	595	998	NR	725	55	NR	855	1	NR	985	0	NR
470	101	NR	600	995	NR	730	47	NR	860	1	NR	990	0	NR
475	64	NR	605	977	NR	735	40	NR	865	1	NR	995	0	NR
480	52	NR	610	949	NR	740	35	NR	870	1	NR	1000	0	NR
485	53	NR	615	908	NR	745	31	NR	875	1	NR			

REPORT NUMBER: SP1-2407-176-3

Scotopic Flux vs. Wavelength

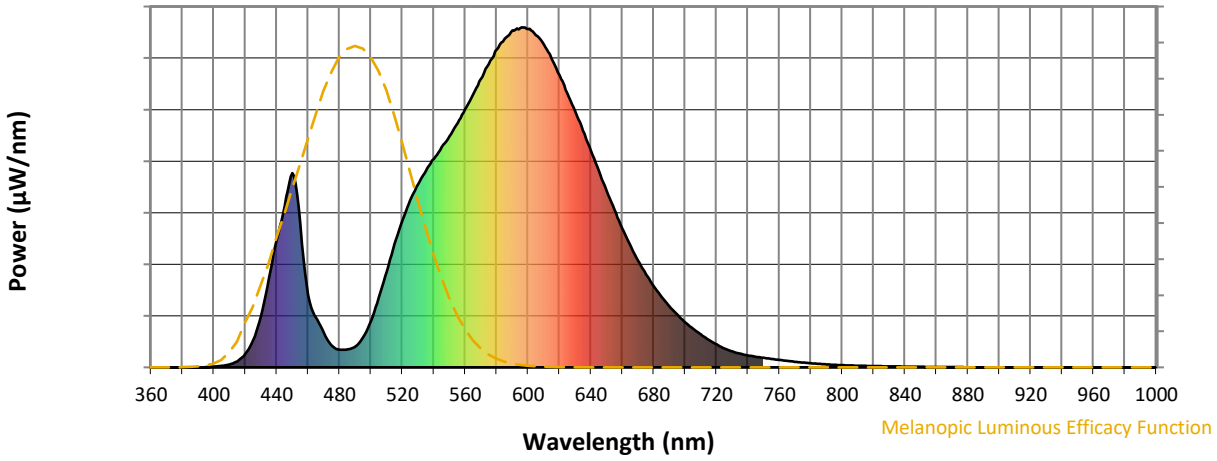


Scotopic Lumens: NR **S/P: 1.15**

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	61	NR	620	859	NR	750	28	NR	880	0	NR
365	0	NR	495	88	NR	625	807	NR	755	25	NR	885	0	NR
370	0	NR	500	137	NR	630	753	NR	760	22	NR	890	0	NR
375	0	NR	505	205	NR	635	697	NR	765	19	NR	895	0	NR
380	0	NR	510	281	NR	640	637	NR	770	16	NR	900	0	NR
385	0	NR	515	363	NR	645	578	NR	775	14	NR	905	0	NR
390	0	NR	520	432	NR	650	520	NR	780	12	NR	910	0	NR
395	1	NR	525	492	NR	655	463	NR	785	10	NR	915	0	NR
400	2	NR	530	539	NR	660	409	NR	790	9	NR	920	0	NR
405	4	NR	535	579	NR	665	359	NR	795	8	NR	925	0	NR
410	9	NR	540	613	NR	670	315	NR	800	6	NR	930	0	NR
415	18	NR	545	648	NR	675	274	NR	805	6	NR	935	0	NR
420	39	NR	550	680	NR	680	239	NR	810	5	NR	940	0	NR
425	81	NR	555	717	NR	685	207	NR	815	4	NR	945	0	NR
430	151	NR	560	759	NR	690	180	NR	820	4	NR	950	0	NR
435	263	NR	565	803	NR	695	155	NR	825	3	NR	955	0	NR
440	375	NR	570	848	NR	700	133	NR	830	3	NR	960	0	NR
445	474	NR	575	892	NR	705	114	NR	835	3	NR	965	0	NR
450	571	NR	580	933	NR	710	97	NR	840	2	NR	970	0	NR
455	421	NR	585	966	NR	715	81	NR	845	2	NR	975	0	NR
460	214	NR	590	991	NR	720	67	NR	850	2	NR	980	0	NR
465	146	NR	595	998	NR	725	55	NR	855	1	NR	985	0	NR
470	101	NR	600	995	NR	730	47	NR	860	1	NR	990	0	NR
475	64	NR	605	977	NR	735	40	NR	865	1	NR	995	0	NR
480	52	NR	610	949	NR	740	35	NR	870	1	NR	1000	0	NR
485	53	NR	615	908	NR	745	31	NR	875	1	NR			

REPORT NUMBER: SP1-2407-176-3

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 2.01**

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	61	NR	620	859	NR	750	28	NR	880	0	NR
365	0	NR	495	88	NR	625	807	NR	755	25	NR	885	0	NR
370	0	NR	500	137	NR	630	753	NR	760	22	NR	890	0	NR
375	0	NR	505	205	NR	635	697	NR	765	19	NR	895	0	NR
380	0	NR	510	281	NR	640	637	NR	770	16	NR	900	0	NR
385	0	NR	515	363	NR	645	578	NR	775	14	NR	905	0	NR
390	0	NR	520	432	NR	650	520	NR	780	12	NR	910	0	NR
395	1	NR	525	492	NR	655	463	NR	785	10	NR	915	0	NR
400	2	NR	530	539	NR	660	409	NR	790	9	NR	920	0	NR
405	4	NR	535	579	NR	665	359	NR	795	8	NR	925	0	NR
410	9	NR	540	613	NR	670	315	NR	800	6	NR	930	0	NR
415	18	NR	545	648	NR	675	274	NR	805	6	NR	935	0	NR
420	39	NR	550	680	NR	680	239	NR	810	5	NR	940	0	NR
425	81	NR	555	717	NR	685	207	NR	815	4	NR	945	0	NR
430	151	NR	560	759	NR	690	180	NR	820	4	NR	950	0	NR
435	263	NR	565	803	NR	695	155	NR	825	3	NR	955	0	NR
440	375	NR	570	848	NR	700	133	NR	830	3	NR	960	0	NR
445	474	NR	575	892	NR	705	114	NR	835	3	NR	965	0	NR
450	571	NR	580	933	NR	710	97	NR	840	2	NR	970	0	NR
455	421	NR	585	966	NR	715	81	NR	845	2	NR	975	0	NR
460	214	NR	590	991	NR	720	67	NR	850	2	NR	980	0	NR
465	146	NR	595	998	NR	725	55	NR	855	1	NR	985	0	NR
470	101	NR	600	995	NR	730	47	NR	860	1	NR	990	0	NR
475	64	NR	605	977	NR	735	40	NR	865	1	NR	995	0	NR
480	52	NR	610	949	NR	740	35	NR	870	1	NR	1000	0	NR
485	53	NR	615	908	NR	745	31	NR	875	1	NR			

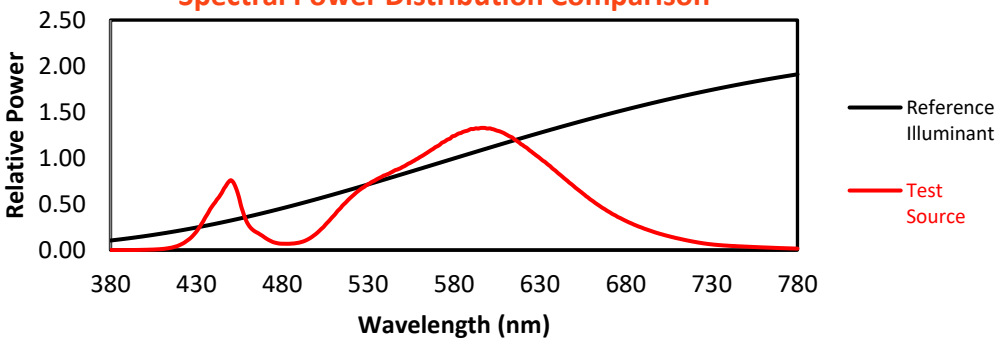
REPORT NUMBER: SP1-2407-176-3

TM-30-18

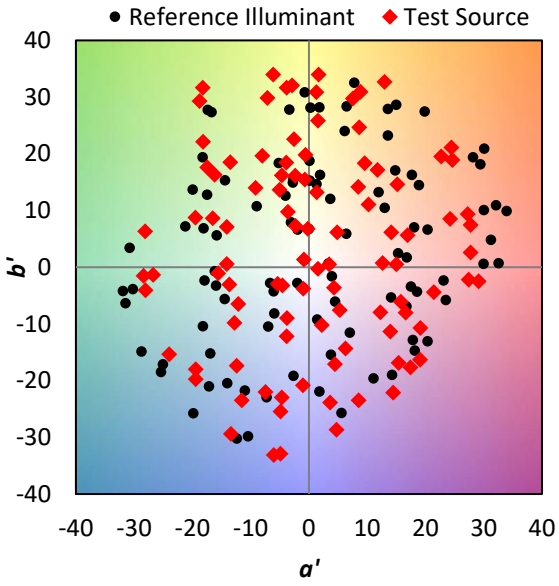
Summary

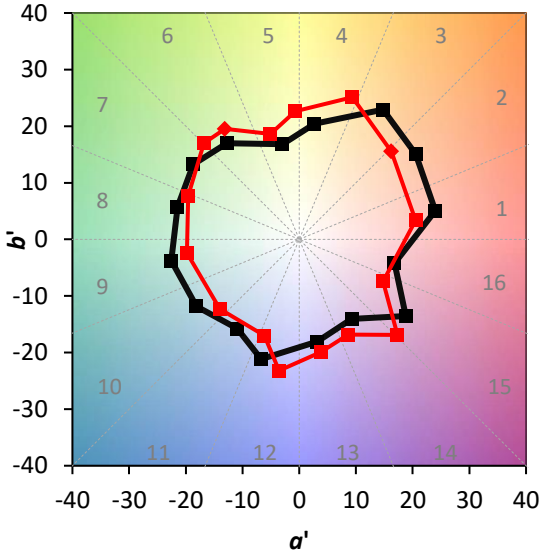
R_f = 73.2
R_g = 95.9
CIE R_a = 71.3
R_9 = -25.2

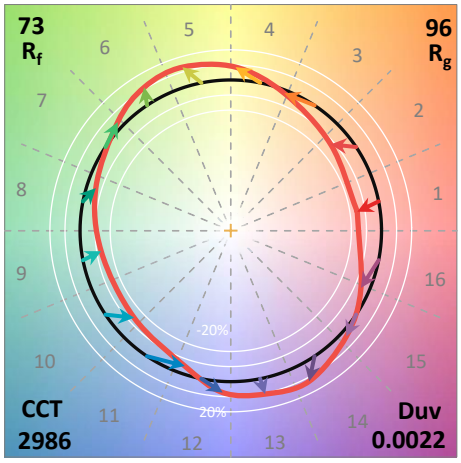
Spectral Power Distribution Comparison

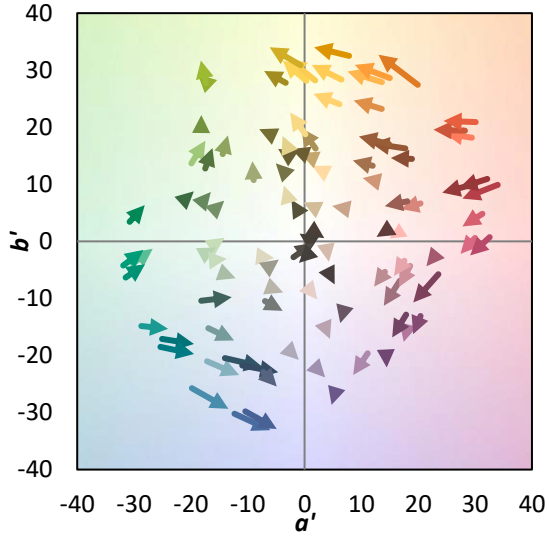


Color Vector Graphics







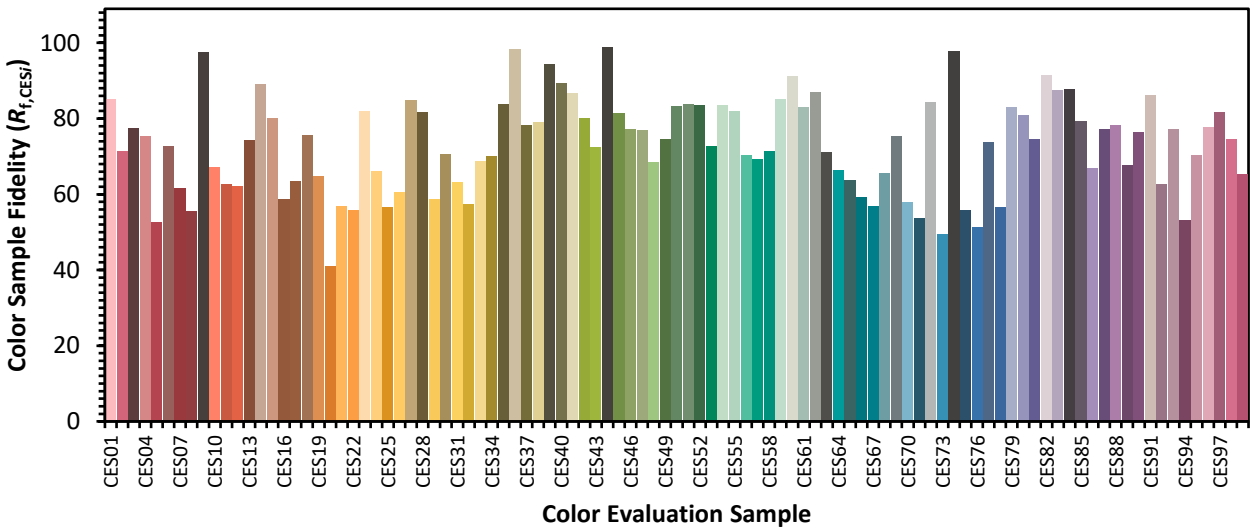


REPORT NUMBER: SP1-2407-176-3

TM-30-18

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

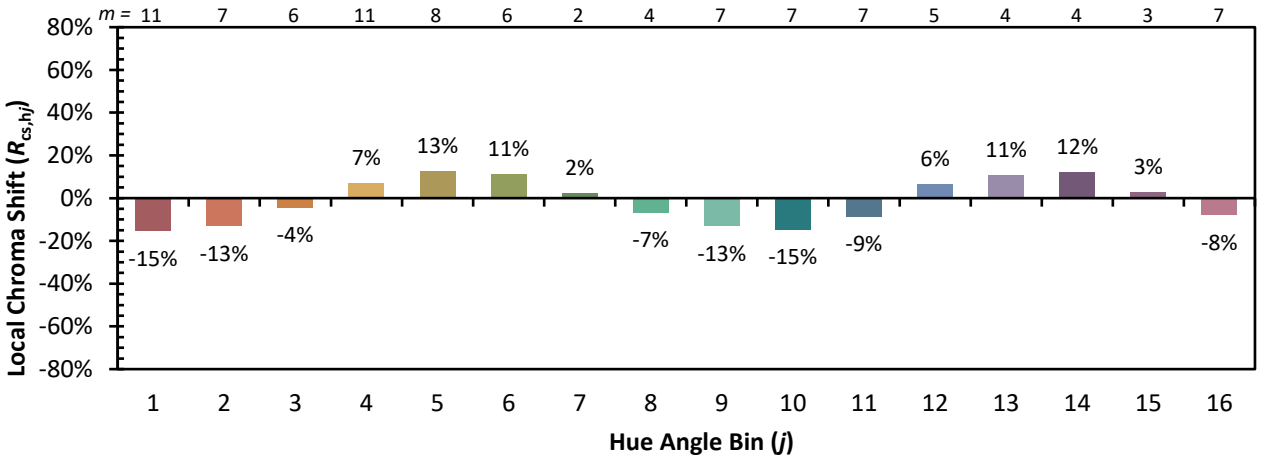
CES01 = 86	CES26 = 61	CES51 = 84	CES76 = 51
CES02 = 62	CES27 = 85	CES52 = 84	CES77 = 74
CES03 = 31	CES28 = 82	CES53 = 73	CES78 = 56
CES04 = 71	CES29 = 59	CES54 = 84	CES79 = 83
CES05 = 49	CES30 = 71	CES55 = 82	CES80 = 81
CES06 = 51	CES31 = 63	CES56 = 70	CES81 = 75
CES07 = 41	CES32 = 57	CES57 = 69	CES82 = 92
CES08 = 40	CES33 = 69	CES58 = 71	CES83 = 88
CES09 = 29	CES34 = 70	CES59 = 85	CES84 = 88
CES10 = 76	CES35 = 84	CES60 = 91	CES85 = 79
CES11 = 59	CES36 = 98	CES61 = 83	CES86 = 67
CES12 = 65	CES37 = 78	CES62 = 87	CES87 = 77
CES13 = 43	CES38 = 79	CES63 = 71	CES88 = 78
CES14 = 74	CES39 = 94	CES64 = 66	CES89 = 68
CES15 = 71	CES40 = 89	CES65 = 64	CES90 = 76
CES16 = 47	CES41 = 87	CES66 = 59	CES91 = 86
CES17 = 50	CES42 = 80	CES67 = 57	CES92 = 63
CES18 = 56	CES43 = 73	CES68 = 66	CES93 = 77
CES19 = 73	CES44 = 99	CES69 = 75	CES94 = 53
CES20 = 66	CES45 = 81	CES70 = 58	CES95 = 70
CES21 = 87	CES46 = 77	CES71 = 54	CES96 = 78
CES22 = 79	CES47 = 77	CES72 = 84	CES97 = 82
CES23 = 92	CES48 = 68	CES73 = 49	CES98 = 75
CES24 = 91	CES49 = 74	CES74 = 98	CES99 = 65
CES25 = 73	CES50 = 83	CES75 = 56	

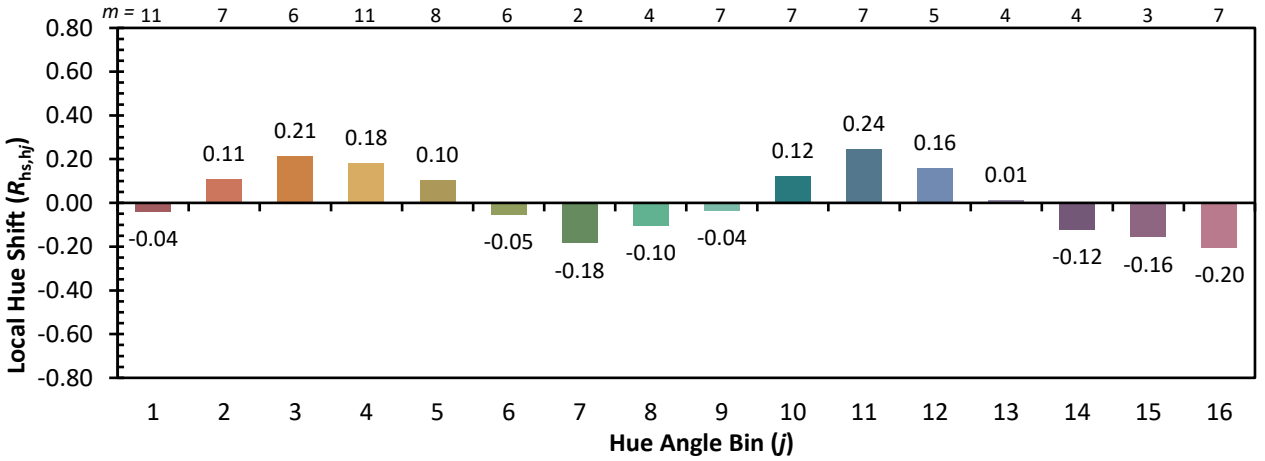


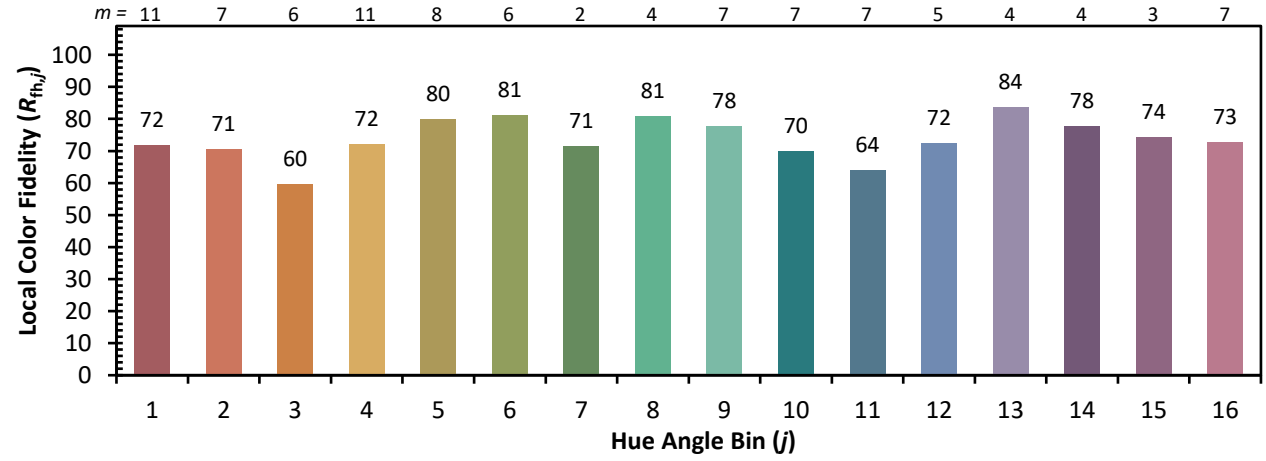
REPORT NUMBER: SP1-2407-176-3

TM-30-18

Color Rendition by Hue-Angle Bin



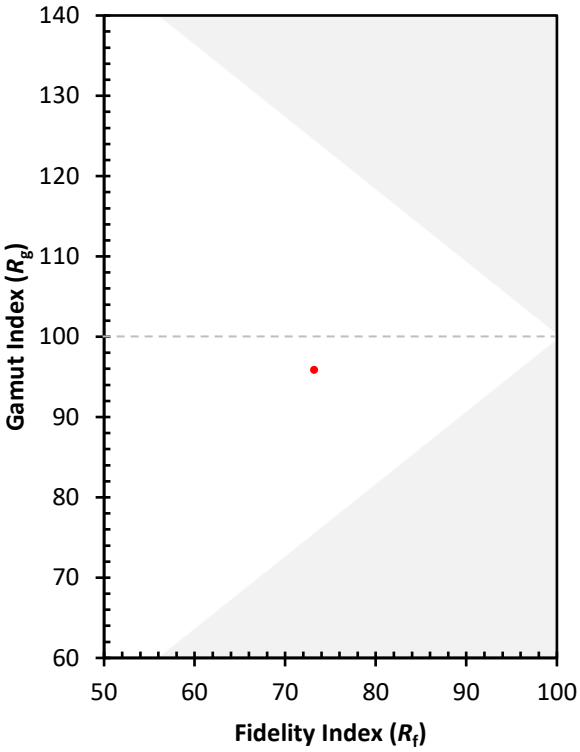


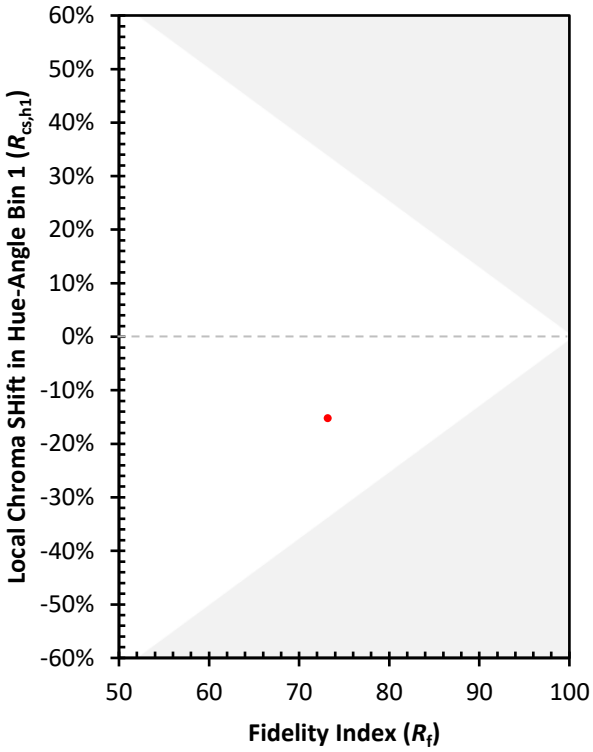


REPORT NUMBER: SP1-2407-176-3

TM-30-18

Measure Comparisons





(END OF REPORT)